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ABSTRACT

National concern over the serious decline and poor performance of United States students in mathematics and science is reflected in this paper which discusses and compares performances and behavioral characteristics of Japanese students with their United States counterparts and, in some instances, with students from Sweden, Australia, England, Canada, France, and Switzerland, in an attempt to explain the magnitude of the differences among them. The descriptions and findings represent a synthesis of research results from major international comparative achievement tests in mathematics, science, and other studies deemed appropriate and important for reporting to the United States public. Among the topics discussed are: performance in mathematics; achievement in science; characteristics and trends in United States science achievement; whether there are differences in mental ability (IQ) between Japanese and United States students; amount of homework; perceptions and attitudes of Japanese students; problems of Japanese youth; learning in Japan; the curriculum in Japan's educational system; the structure of the educational curriculum of Japan; and school guidance and moral education in Japan. The paper also includes tables, a 15-page general bibliography, and several selected bibliographies. (TRS)

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STUDENT CHARACTERISTICS, LEARNING AND CURRICULUM IN JAPAN

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STUDENT CHARACTERISTICS, LEARNING AND CURRICULUM IN JAPAN

Dr. Daniel P. Antonoplos

Performance and Behavioral Characteristics of Japanese Students

INTRODUCTION

The need for educational reform in the United States is of serious concern to educators and social policy makers alike. Some nine major reports on education including A Nation at Risk; Action for Excellence; High Schools: A Report on Secondary Education in America; America's Competitive Challenge; and the Paideia Proposal: An Educational Manifesto have all underscored current concerns with improving education in the United States.

Among the most startling conditions documented by the National Commission on Excellence were the following serious declines and poor performance of American students in mathematics and science:

- "International comparisons of student achievement completed a decade ago reveal that on 19 academic tests American students were never first or second, and in comparison to other industrialized nations were last seven times."
- "The College Board (SAT) demonstrated a virtually unbroken decline from 1963-1980. Average mathematics scores dropped nearly 40 points."
- "Between 1975 and 1980 remedial mathematics courses in public 4-year colleges increased by 72 percent of all mathematics courses taught in those institutions."
- "College Board tests demonstrated consistent declines in physics (and English)"
- "There was a steady decline in science achievement scores of U.S. 17 year olds as measured by National Assessment of science in 1969, 1973, 1977," (and 1981).

In Contrast,

The performance of Japanese students has received notable attention from various sectors ranging from the popular free press to best sellers such as Japan As Number One (Vogel, 1979), The Japanese, (Reischauer, 1981) and empirical research studies including the international comparative studies of achievement among the nations. The attention received has heightened public and professional awareness to identify the performance characteristics of Japanese students and the factors associated with their accomplishment and pervasiveness. Rival explanations such as problems associated with the design, conduct and interpretation of the research have to some extent clouded some of the findings. However, the magnitude of the differences between the Japanese and students from other culture groups and the consistency of high performance across available studies in some areas speak for themselves.

Performance in mathematics

The descriptions and findings which follow represent a synthesis of research results from major international comparative achievement tests in mathematics and science and other studies deemed of appropriate quality and importance for reporting to the American public.

The achievement of Japanese students in the area of mathematics has been well established. Since 1951, Japan has participated in two major international competitive achievement examinations sponsored by the International Association for the Evaluation of Educational Achievement (IEA) located in Stockholm Sweeden (incorporated in Belgium). Recognizing the methodological and logistical difficulties inherent in the conduct of large scale comparative education efforts, these test results are considered a reliable source of information. The Japanese performance in mathematics has been impressive.

The first IEA mathematics achievement tests in 1964 administered to twelve participating countries including the United States, Japan, England, Israel, Belgium, Finland, et. al. demonstrated that overall, Japan ranked in the top three in mathematics of the countries represented. Whether one examines average scores for countries, the statistical distributions, the younger or older students sampled or the different subtests measured, Japanese students demonstrated high levels of mathematical achievement. (Burstein and Hawkins, 1986) In every comparison with Japan, students from the U.S. did very poorly. Furthermore, even the weakest mathematics students in Japan performed quite well in comparison to students from other countries. In the First IEA Mathematics Study, tests of mathematical concepts and operations were administered to four populations of students. These included:

(1) thirteen year olds from schools sampled in the various countries;

(2) all students who were enrolled in the classes where thirteen year olds were enrolled;

(3) students in their terminal secondary year who were taking mathematics; and

(4) students in their terminal secondary year not taking courses in mathematics in the sampled schools. (Husen, 1967 vol. 11)

My examination of the subtest scores provided in the data tables indicate' however, the variability of the Japanese performance and the poor performance of American students. An examination of the scores for Group (1) revealed the fine performance of Japanese students in various dimensions and areas of mathematics. These Japanese thirteen year olds ranked first on: "lower processes," "verbal," "higher processes," "computational," "advanced arithmetic," "algebra," and "geometry;" second on "basic arithmetic," and third on "new mathematics." In contrast, American thirteen year olds in Group (1) ranked last and second

from the bottom across the same subtests with the exception of "basic arithmetic" and "new mathematics" in which they ranked third from the bottom.

Examination of the subtest scores for Group (2) revealed essentially the same patterns and magnitudes with some improvement of the United States in "algebra" to a position of fourth from the bottom. For this population group, however, Japanese students received only one first place ranking in "algebra" and the remaining scores were distributed between second and third with a fourth place ranking in "new mathematics."

The subtest scores for Group (3), students in their terminal secondary year taking mathematics indicated some decrease in Japanese student performance ranging from second to eight place on subtests. Of particular note were Japan's sixth place ranking on "computation," "lower processes" and "logic," seventh in "analytical geometry," and eight place in "calculus." However, American students in Group (3) fell further behind receiving last place on all but three subtest.

The subtest scores for group (4) students in their terminal year not enrolled in mathematics courses revealed a stable performance among Japanese students. Japanese students consistenly ranked among the top three across the subtest previously mentioned with the exception of a fourth place ranking in "analytical geometry." American students placed last on most subtests with the exception of "analytical geometry," "analysis," and "sets," in which they were second from the bottom among the participating countries.

The Second (IEA) International Mathematics Study

The Second International Mathematics Study sponsored by the IEA, and administered to twenty participating countries in 1982 is still under analysis and preparation for publication. Reports to date are not official, and the

reader is cautioned that the preliminary results presented might be subject to some changes in subsequent revisions of various documents from Japan and the United States.

The sample design of the study included two populations of students tested. These were: (1) all students in the grade in which most of the students had reached the age of thirteen by the middle of the school year and (2) all students in the terminal grade of secondary school taking mathematics as a classroom subject for approximately five hours per week. Parenthetically, for population (1) use of this criterion resulted in comparing seventh graders in Japan with eight graders in the United States.

Overall, the Japanese performance is impressive and consistent with earlier findings. Both populations of Japanese students, (13 year olds and students in their last grade of secondary school) were at least 10 percentage points above the international average and the United States average on the various subtests measured by the mathematics tests.

Preliminary results indicate that the Japanese 13 year olds were the highest in all areas while American 13 year olds were at the middle or below in 4 out of 5 areas. It was also reported that in this major international study, Japan chose to test students in the 7th grade instead of 8th grade which would have corresponded to the American sample, apparently because the test content was more suitable for 7th graders in Japan. Japanese 7th graders surpassed American 8th graders by 10-20 percentage points in mathematics.

The following table shows the striking average percent correct and rank order among the 20 participating countries by test content for American and Japanese 13 year old students: Table ( )

TABLE 1: Average percentage correct and rank order among the 20 participating countries by test content area for American and Japanese 13 year old students.

Content Area	Average	U.S. International Rank	Average	Japan International Rank	Twenty Nations Average
Arithmetic	51	10	61	1	51
Algebra	43	12	61	1	43
Geometry	38	16	60	1	41
Statistics	57	8	71	1	55
Measurement	42	18	69	1	51

Source: Table 15 of the summary report for the U.S. Second International Mathematics Study, 9/84 and Table 1.6 of the Mathematics Achievement of Secondary School Students-Second International Mathematics Study (National Report of Japan: Vol. 1) 9/81. Provided by the National Center for Educational Statistics to the U.S. Study of Education in Japan OERI/DOE.

- o Japanese 7th graders in all topics demonstrated the highest mathematical achievement. In the areas of "Arithmetic," "Algebra," "Geometry," "Statistics," and "Measurement," these 7th graders ranked number 1 internationally. The topics on "probability statistics," and "Measurement," showed relatively high performance. Compared to their own performance in other areas their performance in "Geometry" was lower.

  In comparison United States eight grade students ranked as follows: "Arithmetic" 10th, "Algebra" 12th, "Geometry" 16th, "Statistics" 8th, and "Measurement" 18th, among the twenty participating nations. The American performance in "Geometry" and "Measurement" were especially low and should be of serious concern.

- o Japanese 7th graders were high on mathematical "Computation" and "Applications" but notably weaker in "Comprehension" and "Analysis" in comparison to their own performance on other tasks as noted by Table ( ).

Table ( ) Average Percent of Correct Responses of 13 year old Japanese Students by Content Topics and Behavioral Categories (Performance Tasks)

Content \ Behavioral Category	Computation	Comprehension	Applications	Analysis	Total
Arithmetic	69.0	49.3	63.1	58.7	60.5
Algehra	65.2	52.5	60.9	59.2	60.6
Geometry	59.8	57.7	60.9	63.4	59.6
Probability/Statistics	63.8	74.8	73.9	66.9	71.1
Measurement	75.2	65.0	70.5	35.1	68.8
Total	66.3	57.9	64.2	58.3	62.5

The average percent of correct responses for Japanese 13 year-olds was (62.5%).

- o Japanese 7th graders in mathematics made notable gains on topics that were specifically emphasized by instruction and curriculum during the school year demonstrating among other factors, the importance of the curriculum in Japan.
- o In contrast U.S. 13 year olds (8th graders) gained less mathematics achievement over the school year. Associated with this finding, was the observation that instructional emphasis in U.S. Schools varied more; there were more differences between classrooms, and therefore curriculum and instruction were less consistent in quality.
- o Japanese 12 grade students ranked second on "sets and relations" "number system," "probability and statistics" and "elementary functions/ calculus." Within their high performance their scores were lower in geometry than in other areas. Their performance on "Computation" was high and in comparison to this, they were weaker in "Comprehension" and "Analysis". Within the Japanese 12th grade performance the following distribution was observed: Table ( ).

Table ( ) Average Percentage of Correct Responses by Content Areas and Behavioral Categories for Japanese Students in the Terminal Secondary Year

Contents \ Behavioral Category	Computation	Comprehension	Application	Analysis	Total
Set & Relations	74.8	81.9	87.2	75.5	79.7
Number System	77.4	57.7	75.0	72.1	71.8
Algebra	84.1	68.3	72.6	65.4	75.5
Geometry	58.2	53.1	61.5	56.3	57.7
Elementary Functions Calculus & Analysis	71.9	68.1	68.7	65.6	69.1
Probability Statistics	87.5	53.1	62.4	----	71.8
Finite Mathematics	----	83.9	68.6	----	76.2
Total	73.3	66.0	69.1	65.7	69.2

Source: National Report of Japan, Volume I Second Mathematics Study, National Institute for Educational Research, Tokyo, 1981.

- o In contrast, 12th grade U.S. students ranked 10th "set and relations," 12th in "number system," "geometry," and "probability statistics," and "elementary functions/calculus." and 14th "algebra," in comparison to the twenty participating nations. This poor performance should be of serious concern to American educators and the public alike.
- o Changes in Performance in Mathematics between 1964 and 1984 based on the First and Second Mathematics Studies (IEA).

  In general mathematical performance for 13 year olds in Japan between 1964 and 1984 was quite stable with some gains in "Algebra" and "Computation" and some loss in "Arithmetic," "Statistics," "Applications" and "Word Problems."

  For Japanese students in the 12th grade, there was improvement in all areas, including the performance tasks of "computation," "applications," "comprehension," and "applications and analysis."
- o In Comparison there was a decline in U.S. eight grade achievement in mathematics between 1964 and 1984. This included a modest decline in end of the year performance in "algebra," "statistics," "measurement,"

and a greater decline in "arithmetic" and "geometry." (as measured by the First and Second Mathematics Studies 1964, 1982)

The performance of U.S. eight grade students declined in the performance tasks of "computation," "comprehension" and "applications and analysis." In these areas, the largest declines were in "comprehension" "applications and analysis" signaling a decline in higher cognitive levels.

There was some improvement for 12 grade students in the United States on "Sets and Relations" and on "Elementary Functions/Calculus."

Other results are difficult to interpret due to changes in the ratio of the age groups enrolled in college prepatory programs in the U.S. since the First Mathematics Study.

- o The methods by which Japanese children are instructed in mathematics differ from typical American teaching. Although more time within class is apparently spent on whole class instruction in Japanese elementary schools, cooperative learning is more evident and some scholars believe it is more "horizontal." It is hypothesized that children are encouraged to make connections across different meanings and ways of expressing the same ideas. Although this distinction is not widely referenced, it is well recognized. (Easley and Easley, 1983 in Burstein, and Hawkins p 118, U.S. Commissioned paper, 1986)
- o Japanese students spend considerably more time during elementary school years learning mathematics and are therefore exposed to more concepts and skills. (Time and Exposure)

(Stevenson, Lucker et al 1982, Burstein U.S. Commissioned paper.)

- o The differences between Japanese and U.S. achievement in mathematics appears to increase with age from about 18 points for 15 year olds to

more than 26 points for 17 and older groups. (Harnish and Sato 1983, in press; in U.S. Commissioned Report, Burstein and Hawkins, 1986)

- o Japan's outstanding performance in mathematics has continued through the 13 years between the First and Second International Mathematics studies.
- o Within a given year of instruction, Japanese students demonstrate notable gains on topics specifically covered by the curriculum.
- o Gender differences in performance are usually negligible at the earlier ages but favor boys at the older age levels.
- o On mathematics items the Japanese particularly scored very high, "opportunity to learn" data indicates that both teachers and students report coverage of those items by instruction/curriculum. The similarities among these items further indicates they are not entirely "computational." Instead it appears that most of these items are concepts that involve teachable algorithms, and rules. Furthermore, it appears that if the Japanese have been taught to approach a particular kind of problem, most learn the concepts, or rules to solve it. (U.S. Commissioned Report, Burstein and Hawkins, 1986)
- o Where there is little "opportunity to learn" in terms of coverage by instruction and curriculum, such as "square roots" "pythagorean theorem," "transformational geometry," performance (in Japan) is low.
- o There is some indication that achievement on verbal items is less than that for computational items.
  (U.S. Commissioned Report; Burstein and Hawkins, 1986)
- o 12 grade students in Japan with high achievement in mathematics rated the use of calculators and computers as mandatory for the learning of mathematics. (National Report of Japan, Volume I Second Mathematics Study, 1981)

- o In comparison the United States side of the Mathematics Study showed about one third of the 12th grade mathematics classes used calculators once or twice a week and about twenty percent of the mathematics classes in the USA "never used or were not allowed to use the calculators in class." (Second International Mathematic Study, Summary Report for the United States, May 1985)
- o In Japan, of the various varahles examined in relation to achievement in mathematics, the variable having the strongest influence on student achievement for both 7th graders, and 12th graders, was the desire to go on to higher educational institutions. (National Report of Japan, Volume I, Second Mathematics Study, Japan 1981)
- o According to the National Report of Japan Volume I, 1981 "the relationship between growth in achievement and classroom processes or teaching methods...still needs further analysis."
- o Teaching Philosophy of Teachers

  In the IEA Second International Mathematics Study, Japan, (National Report of Japan: Volume I, 1981) it was reported by Japan that the results indicate that: mathematics teachers in Japan can he clasified into three types.

  (1) teachers who focus on logical thinking;

  (2) teachers who emphasize calculation;

  (3) teachers who emphasize interest and concern of students.

  The results of the study of Japanese teachers did not indicate "a positive relation hetween student achievement and any particular kind of teacher in Japan."
- o Teacher Opinion of Teaching Content

  According to the IEA Second Mathematics Study in Japan. (National

Report of Japan, Volume I, 1981) Japanese teachers are in agreement on the importance of emphasizing the "understanding and principles of rules of computation as well as understanding the process of solution."

Time Spent in Mathematics Instruction in the Classroom:

- o Japanese students spend more time in school but seventh graders spend less time in the classroom receiving mathematics instruction than eight grade students in the United States. In the Second (IEA) Mathematics Study, Japanese teachers reported that the official length of the school year was 240 days, compared to 180 days in the United States. It was reported in this empirical study by teachers, that Japanese students attend only 4 periods of classroom instruction in mathematics (during their six-day week) compared with 5 periods of mathematics instruction in the United States. An average classroom period for Japan and the United States in mathematics was reported to be 50 minutes.
- o According to Kenneth Travers, Chairman of the International Mathematics Committee of the Second Mathematics Study "the average time spent on eight-grade math instruction in the United States (145 hours per year) is comparable to that in most other countries...Japanese students spend only about 100 hours in math even though they have 240 school days, compared with our 180. Moreover, class size is about 40 students in Japan, whereas in the United States it is about 26." (Travers, K. "Eight Grade Math: An International Study", (Principal, September, 1985)
- o According to Travers, the IEA Second Mathematics study showed that four distinct kinds mathematics classes exist in the U.S. at the eight grade level which may be affecting the high school mathematics

performance of these students. These include: remedial classes, enriched classes, algebra classes and "typical classes." Differences in mathematics coverage of these classes may be interfering with student achievement in mathematics and high school preparation. For example, in remedial classes, math exposure is limited and not much is taught beyond arithmetic which is learned to a limited degree. These students are not prepared for high school mathematics. At the other end, Algebra students do very well and are not sufficently challenged by the typical high school mathematics curriculum in the U.S. (Travers, K. "Mathematics Achievement in U.S. Schools: Preliminary Findings From the Second IEA Mathematics Study "Phi Delta Kappen, February 1985.)

In mathematics classes in the U.S. most of the student time was spent on "seatwork," "blackboard work" and attending to oral presentations (lectures) and "explanations." (U.S. Report, Second Mathematics Study, 1985)

o Intended curriculum - According to Travers: "From the perspective of other nations, the eight-grade mathematics curriculum in the U.S. looks more like a program of studies for the end of elementary school than for the beginning of high school. Our curriculum appears to be dominated by topics in arithmetic and measurement rather than by the study of algebra and geometry." (Kappan, 1985)

Implemented curriculum - According to Travers: "One clear finding of the study is that there is a great diversity in mathematics taught in U.S. schools at the eight grade level." (Kappen, 1985)

THE DALLAS TIMES HERALD STUDY

An international study of achievement in mathematics, science and geography was commissioned by the Dallas Times Herald (1983) to determine the extent which sixth grade students from seven other countries compared with students from the United States. The comparison countries included: Japan, Sweeden, Australia, England, Canada, France, Switzerland, (and the United States). The tests used to measure the "relative achievement" of sixth grade students were developed by four prominent educators including: Nobel Prize-winning scientist Glenn T. Seaborg, the developer of the science test; Stephen Willoughby, President of the National Council of Teachers of Mathematics, author of math texthooks the developer of the mathematics test; Gilbert White of the National Academy of Science, former President of the Association of American Geographers and developer of the geography test, and Joseph Stoltman, a professor at Western Michigan University and Chairman of the Commission on Education, International Georgraphical Union.

The Dallas Times Herald Staff administered the tests to students in sampled schools selected by the participating foreign government and in some cases by leading foreign news papers in the countries represented. Following test development, the tests were translated into the respective appropriate foreign langauges. Over 600 students were tested with between 50 and 145 sixth graders representing each country.

The tests, designed to measure broad educational goals rather than specific information from the curricula of the various countries represented what four educational experts ascertained as important knowledge the average 12 year-old child growing up in a technological society should be able to demonstrate. As

a result the majority of the questions required students to problem solve and think rather than simply to recall factual information.

- o According to the Dallas Times Herald staff writers, Japanese 12 year-old student did twice as well as the American Students in mathematics and significantly out-performed students from all the other countries. The United States students finished last in mathematics.
- o In science, sixth grade students from Swe:den achieved a first place ranking with Japan placing fifth and the United States ranking sixth out of the eight participating countries.
- o The results of the geography test indicated that Japan received the lowest percentage correct scores ranking last, and was surpassed by the United State's attainment of a fifth place ranking out of eight participating countries. Table ( ).

Table ( ) Percentage of Correct Answers Among 12 Year-Olds Taking Test In Each Country.

MATH		SCIENCE		GEOGRAPHY	
Japan	50.2	Swe:den	55.4	Swe:den	54.1
Sweeden	39.7	England	54.5	England	50.5
Australia	37.9	Australia	49.2	Canada	48.0
England	37.8	Canada	49.2	U.S	45.8
Canada	35.8	Japan	45.3	Switz	43.4
France	33.3	U.S	43.7	Australia	42.7
Switz	31.0	France	42.1	France	41.3
U.S	25.3	Switz	41.3	Japan	40.5

Achievement in Science

The overall achievement of Japanese students in science has been very admirable.

Although the results of the previously described Dallas Times Herald Study indicated Japanese sixth grade students (ranking fifth) and American sixth grade students (ranking sixth) were close in science performance, the gap in science performance between Japan and the United States has been demonstrated at some other age levels; in various subject areas of science and in kinds of performance tasks e.g. "Information," "Understanding," "Applications," and "Higher Processes." The consistency of the overall Japanese performance has been demonstrated in the following two major international studies of science achievement sponsored by the IEA. It should also be noted that within the Japanese performance there is some variability of performance at the 14-year-old level. However, because of the high average scores obtained by this population, it has been posited that even the poorest scoring Japanese students probably compared quite well to students from other nations. There is no statistical information provided by Coomber and Keeves on this point.

The First IEA International Science Study

The First IEA International Science Study as described by Coomber and Keeves (1973), examined the performance characteristics of students from nineteen countries. These countries included Belgium, England, the Federal Republic of Germany, Finland, Hungary, Japan, Sweden, the United States, Thailand and others. Science performance was tested in "Biology," "Earth Science and Chemistry," and "Physics," and in the performance tasks of "Information," "Understanding," "Applications," and "Higher Processes." The

population of students sampled included 10-year-olds, (population I), 14-year-olds (population II) and all students in the last year of secondary school, designated as (population IV). Japan did not participate at all three population levels examined but chose only to participate in the ten-year-old, and 14-year-old testing (populations I and II).

According to Burstein and Hawkins (1986), Japan's excellent performance in science was well demonstrated. Their review of the First IEA Science Study showed that "the average performance for Japanese 10-year-olds was 5 points higher than the international mean and about 3.5 points higher that the next highest scoring country, (Sweden). According to these researchers, Japan's performance was also quite homogenous for this younger age group (p 29).

In comparison, although, the average score for United States 10-year-olds was above the international average, the dispersion of scores within the United States was also the highest among the nations tested.

Data for the 14-year-old group in Japan revealed an average score of 31.2 approximately 9 points higher than the international average. At this age level the variability of Japan's scores according to Burstein and Hawkins (1986) "was the largest among the participating nations.

Antonoplos' (1986) analysis of the standardized subtest scores from the primary data tables provided by Coomber and Keeves (1973) in the First IEA Science Study indicated:

- Japanese ten-year-olds placed first in "Biology," "Earth Science/Chemistry," and "Physics." In contrast, United States 10-year-olds placed seventh in "Biology," seventh in "Earth Science/Chemistry," and a notable second place in "Physics."

- o Japanese 14-year-olds placed third in "Biology," and first "Chemistry," "Physics," and "Practical Science." In comparison, United States 14-year-olds placed sixth in "Biology," ninth in "Chemistry" and "Physics," and eleventh in "Practical Science."

Antonoplos' examination of the data for 10 and 14 year-old students in Japan by behavioral objectives (or kinds of performance tasks) indicated that:

- o Japanese 10-year-old students ranked fourth in "Information," and first in "Understanding," "Applications," and "Higher Processes." In contrast, United States 10-year-olds ranked fifth in "Information," and "Understanding," ninth in "Applications," and second in "Higher Processes."
- o Japanese 14-year-olds ranked second in "Information," and first in "Understanding," "Applications," and "Higher Processes." In contrast, United States 14-year-olds ranked eight in "Information," tenth in "Understanding," eight in "Applications," and seventh in "Higher Processes,"

Parenthetically, Antonoplos has noted that the Japanese performance for:

- o 14-year-olds in "Biology," (.46) was clearly surpassed by Hungary (.73) and by Thailand (.64) one of the defined "Developing Countries" in the First IEA Science Study.

Furthermore, the Japanese performance for:

- o 10-year-olds on "Information" (.22) was clearly surpassed by Thailand (.47), Belgium (.32) and Sweden (.24).
- o 14-year-olds on "Information" (.24) was very notably surpassed by Hungary (.99).

Contrary to public opinion, Antonoplos, (1986) Burstein and Hawkins (1986) have concluded that the narrow sterotyped perception of Japanese students as information memorizers with little comprehension or inferential thinking is quite inaccurate. The data on science achievement show Japanese students are even more able in "Understanding," "Applications," and "Higher Processes" than they are in "Information" accumulation.

Other Relevant Findings: Sex Differences

The data from the First IEA Science Study (1973), demonstrated that:

- Sex differences in science achievement were characteristic of all the participating nations in the study. In Japan girls performed very well in comparison to boys and girls from other nations. For example, at age 10, Japanese girls ranked second to Japanese boys in "Biology," "Earth Sciences" and third (after boys from Japan and the U.S.) in "Physics." At age 14, Japanese girls ranked fourth in "Biology," "Chemistry," and fifth in "Physics." (Burstein and Hawkins 1986).
- (Girls from Hungary ranked higher than girls from Japan in "Biology" and "Chemistry," and surpassed boys from the United States on every subtest!)

The Second International Science Study

The Second International Science Study was conducted by the International Association for Educational Achievement in 1982. Only preliminary findings are available as the data is currently being analyzed by Japan, the United States and other participating nations and reports as yet have not been published. Comparative data on the rankings of participating countries as yet have not been released.

It is the opinion of this author that a caveat is in order with respect to the interpretation of the United States data. The United States side of this major international study was plagued by an inordinately low response rate (less than 50%). Most social scientist do not accept a response rate lower than 75%. As a result of the low response rate, considerable debate has been stimulated as to the feasibility of proceeding with the analysis and interpretation of the United States data. However, the United States IEA team in an additional study has found no significant difference between respondees and non-respondees suggesting the two populations are similar and the data is reliable.

Although this problem, in the opinion of this author cannot be completely circumvented, this author has attempted to use "multiple measures" where possible from other respected and relevant large scale data bases such as: The National Assessment of Educational Progress and the High School and Beyond Study (Japan and the United States) to buttress the potentially weakened United States data and empirically demonstrate characteristics and trends in science achievement among United States students.

Twenty-six nations participated in Second IEA Science Study including: Australia, Canada, China, Finland, Hungary, Israel, Italy, Japan, Singapore, Korea, Norway, Thailand, the United States, the Phillipines, Zimbabuo and others.

Three populations of students were examined. These were: 10-year-olds, (population I), 14-year-olds (population II), and 12th grade students (population III).

In order to obtain data on science education and the performance characteristics of Japanese and United States students, this author wrote the specifications for a commissioned research study titled "An Analysis and Comparison

of Science Education in Japan and the United States, and assembled a research team under contract headed by Willard Jacobson, Director of the IEA Second Science Study, USA, that included Shigeo Kojima, Director, Research Center for Science Education, National Institute for Eduational Research, Japan, Rodney Doran, Associate Research Coordinator, Second IEA Science Study, USA, Shigekazu Takemura, Professor of Science Education Hiroshima University, Japan, Maso Miyake, Associate Coordinator, Second IEA Science Study, Japan, and Eva Humrich, Research Assistant, Second IEA Science Study, USA.

The following major findings were reported by this research group: (Jacobson, et.al. 1986)

- o Differences in science achievement between United States and Japanese students appear to increase as one progresses up the educational ladder. At the fifth grade level, the average score of correct responses on the core achievement test were about equal. At the ninth grade level Japanese students had about two more items correct. At the 12 grade level, Japanese students had a notable seven more items correct than United States students.
- o Japanese students tend to achieve better than U.S. students on questions identified as measuring science process skills (process skills include such skills to measure or classify in order to carry out inquiries in science).

The greatest difference in science achievement between Japanese and American students favoring the Japanese performance is as the 12-grade level in physics. This should be of serious concern to science educators and the American public.

- o Sex differences in science achievement do occur in Japan and the United States, but the differences between male and female achievement in science are substantially less in Japan than in the United States.
- o Japanese students spend more time studying in general, and especially spend more time on science education than do students in the United States.
- o There is some evidence that Japanese elementary school children have more frequent concrete laboratory type experiences than do United States elementary school children.

  There is "some evidence" that United States secondary students have more concrete laboratory type experiences than do Japanese students.
- o In Japan and the United States, variables correlating highly with science achievement are: "the number of books in the home," and "whether or not I like science."
- o Japanese "Science Education Centers" are important institutions for in-service teacher education in science and for unique science experiences for students. In the United States there are limited comparable institutions that perform these functions.

It has been observed that:

- o The Japanese procedure of starting the school year in April, followed by the summer vacation allows the same teacher to both assign, and discuss the summer assignment and them evaluate the work when the children return to school. One American observer has concluded that the summer homework evaluated by the same teacher as the students had in the spring may be the reason why students in Japan do not forget half of what they learned during the year.

Characteristics And Trends In United States Science Achievement From Other Data Sources

The following findings from other data sources that include: The National Assessment of Educational Progress and the High School and Beyond Study (United States and Japan) appear to support some of the findings of the Second IEA Science Study, especially as regards science "process" achievement in the United States.

In the 1981-1982 National Assessment:

- o There was a decline of 4.2% on scientific method skills involving the design of science experiments, the results support the observation that United States students are having fewer inquiry (and process) experiences. (Hueftle S. Rakow, 1983 p 14)
- o Less than 40% of the students answered correctly on process items testing critical examination of theory and scientific work. (Hueftle S. Rakow, 1983 p 39)
- o "There are two areas in which 9 year olds, declines from 1977 to 1982 on Inquiry items are significant; drawing conclusions from data (a significant decline of 2.8%) and scientific method (a significant 4.2% decline). (NAEPIRS, 1983 ID:4004)
- o "Among the science content areas Process methods appear to create problems for Black students; the deficit was 17 percentage points at age 9; 13 points at age 13; and 19 points at age 17." (NAEPIRS, 1982 ID:3345).
- o "Males consistently had more science related experiences than females; at all three age levels (9,13,17) male average was 4-5, percentage points above that of females." (NAEPIRS, 1979 ID:5166)

- o "Out of all science assessment areas, the most consistent declines for age 13 between 1976 and 1981 were found in student's perception of the value of science." (NAEPIRS 1983, ID:4137)
- o "Of the 13 year olds, 73% said they were sometimes, always or often bored in their science classes and a majority said they didn't like to go and felf unsuccessful." (NAEPIRS 1983, ID:4128)
- o "Both 17 year old males and females declined significantly in science content achievement between 1977 and 1982: Males declined by 2.2% and females by 1.7%." (NAEPIRS 1983, ID:4211)
- o "At age 17, males outscored females on process skill items by 14%. Between 1977 and 1982 males declined by 2.7 and females by 2.0%." (NAEPIRS 1983, ID:4224)
- o Students in United States high schools had considerably less course work in science (and mathematics) than students in Japan. In Japan, all students took at least "one course each in science (and mathematics) each year in upper secondary school." In the United States school districts for the most past required 1.6 credits in science and (1.7 credits in mathematics) for graduation. (Center for Statistics Bulletin, May 1984)

Selected Bibliography (Achievement:Science)

Burstern, L. and Hawkins, J. "An Analysis of Cognitive, Non-Cognitive and Behavioral Characteristics of Students in Japan." U.S. Commissioned Research, United States Study of Education in Japan, OERI, D.O.E., Contract # NIE P-85-3036, February, 1986.

Center for Statistics. "Science and Mathematics Education in American High Schools: Results from the High School and Beyond Study." Center for Statistics Bulletin, OERI, Department of Education, May 1984.

Comber, L. C. and Keeves, S. (1973) Science Achievement in Nineteen Countries, New York:Wiley.

Hueftle, S. J., Rakow, S. and Welch, W. "Images of Science: A Summary of Results from The 1981-1982 National Assessment In Science." Minnesota Research and Evaluation Center, National Science Foundation Grant SED 8022125 A01, 1983.

Ito, Nobutaka et.al. "Basic Science in Upper Secondary School Education in Japan, II. The Structure of Basic Science and Examples of A Teaching Program." Science Education, 60(4) 1976, 441-452.

Jacobson, W. J. and Takemura, S., et.al. "Analysis and Comparison of Science Education in Japan and the United States." U.S. Commissioned Research, United States Study of Education in Japan, OERI, DOE, Contract # NIE P-85-3062, 1986.

Miyake, Masao, and Kojima, Shigeo. "Some Findings in Japan from the Second International Science Study." Statistical Report Presented at the International Study Committee Meeting for the Second International Science Study, Rome, National Institute for Educational Research of Japan, September, 1985.

NAEPIRS. NAEP Informational Retrieval System, National Assessment of Educational Progress, National Institute of Education, 1983.

Takemura, Shigekazu. "Study on Position of Science Education in Japan" (Unpublished manuscript). Faculty of Education, Graduate Study, Hiroshima University, Japan.

Tokyo Office, National Science Foundation. "Precollege Education in Mathematics, Science and Technology:Japan." Report Memorandum #I August 24, 1982.

Tokyo Office, National Science Foundation. "Precollege Education in Mathematics, Science and Technology: Some Questions and Answers." Report Memorandum #10, January 7, 1982.

ARE THERE DIFFERENCES IN MENTAL ABILITY (I.Q.) BETWEEN JAPANESE AND AMERICAN STUDENTS?

FINDINGS: MENTAL ABILITY

One of the most controversial research findings was proposed by Richard Lynn (1982). In an attempt to explain the academic success of Japanese children he proposed that differences between Japanese and American children were due to differences in cognitive (mental) ability such as I.Q. Lynn concluded that the average I.Q. of Japanese children exceeded their American counterparts by 11 points and that at 111, "the average I.Q. in Japan is the highest recorded for a national population by a considerable order of magnitude." (Lynn, 1982 p 223)

Lynn's conclusions have been seriously questioned by other scholars for a variety of methodological reasons. That include the ways in which he conducted his research and analysis procedures. (Stevenson and Azuma, 1983, Flynn 1983, Vining 1983) Furthermore, other researchers e.g. Stevenson et.al. in their investigations of differences in cognitive (mental) ability among Japanese, and American children were not able to support Lynn's conclusion. These scholars have concluded that although some differences occurred in mathematics, similarities not differences best describe the cognitive functions of Japanese and American children. Morever, when differences were found, they did not always favor the Japanese performance:

Stevenson, Stigler, Lee and Lucker found:

- Other Asians were quite superior on tasks assessing serial memory for numbers, however, this superiority did not extend to words.
- Japanese children received consistently low scores on memory tasks involving verbal materials. Other Asians and American children did better on memory tasks than Japanese children at the fifth grade level and on serial memory for words at the first and fifth grade levels.

- Japanese children at both first grade and fifth grade scored highest on auditory memory tasks.

FINDINGS: OTHER CHARACTERISTICS

Self Concept:

- o Japanese responses to items about self-worth and satisfaction are lower than Americans. Less than one-third of Japanese students sampled agreed with statements of self worth. In contrast, 80% of U.S. students responded positively to the same items (p. 89).
- o Japanese students, even though performing very well in mathematics were prone to consider school mathematics very hard, and have a low opinion of their ability in mathematics than students from other countries. (Burstein and Hawkins, 1986) These findings are difficult to interpret as there are cultural tendencies toward humility and self-critical behavior in Japan.
- o A true difference in self concept may be difficult to ascertain between American and Japanese students. The Japanese as a group may be highly self critical, because of cultural learning or their attitudes might truly indicate reactions to the preasures of the educational and examination system. In comparison, the responses of U.S. students are often likely to exhibit overconfidence, and self-assurance, because American society highly values free expressions and assertiveness.

Locus of Control

The "locus of control" construct is a way of understanding whether the elements that account for one's behaviors and performance are under one's personal control (intrinsic to the individual) or external, (pressures from the outside environment) Current methods of understanding locus of control, is through the ways people attribute success and failure.

Across time and age groups empirical research results in this area is conflicting Some studies have found that Japanese students tend to feel that mankind has control over its own destiny, while U.S. students judge mankind as being under the control of environmental forces. Other studies, have shown that: Japanese students attribute success to "good luck" twice as much as American students and a higher percentage (77%) of American students agree "what happens is my own doing" compared to 59% percent in Japan. (Burstein and Hawkins, 1986)

It may be that the cultural perspective and situational context influences the results on locus of control.

Homework

Utilizing data from the High School and Beyond Study of high school seniors in the U.S. and in Japan, Fetters, Owings, Suter, and Takai (1983) found:

- o the "typical Japanese student spends more time on homework than the typical American student." (p. 9)

In the United States, 27 percent of all seniors committed at least 5 hours per week on homework. In Japan, 65 percent committed at least 5 hours per week and 36 percent of Japanese high school seniors committed over 10 hours a week as compared to 6 percent of American seniors.

Stevenson, Lee and Stigler, (1986) in their study of Japanese and American children found that American children spend less time on homework than do Japanese children at the first grade, fifth grade levels and notably, both groups spent much less time on homework than Japanese children on weekends. Mothers estimates of homework for these groups indicated:

	Japan	United States	
Grade 1	37	14	minutes/day
Grade 5	57	46	minutes/day
	Weekends:		
Grade 1 & 5	37	07	Saturdays/minutes/day
Grade 1 & 5	29	11	Sundays/minutes/day

Stevenson et. al. further concluded that Japanese mothers gave more help to their children when doing homework than did American mothers. In addition, there were unobtrusive indicators of Japanese "parental concern" for the accomplishment of homework such as: 98 percent of the Japanese but only 63 percent of the American children had a desk at home. When children were not

directly engaged in homework, 58 percent of Japanese mothers encouraged their fifth graders to practice solving problems in workbooks made available to them by their parents. In comparison, only 28 percent of American mothers reported purchasing workbooks (in mathematics) for their children.

Preliminary analysis of the IEA Second Mathematics Study with regards to the question of "homework" based on teacher estimates by analysts of the Center for Statistics, OERI (Chen, 1985) is somewhat conflicting. The findings indicate: teacher estimates suggest United States students are assigned more homework than are Japanese students. Japanese teachers assigned an average of 1.7 hours per week in mathematics. In comparison, U.S. teachers estimated they assigned an average of 2.6 hours per week. 95 percent of the Japanese teachers stated they required 3 hours or less homework in mathematics. In comparison, 83 percent of the U.S. teachers required 3 hours or less of mathematics homework per week.

The analysis of student data from the Second Mathematics Study, however, indicated that the typical student in Japan and the United States spend about the equal amount of time on mathematics homework assigned at school. Both Japanese and American students reported working an average 2.6 hours per week on mathematics homework. It should be noted, however, that 12 percent of the United States students sampled reported they did not spend any time on mathematics homework, whereas only 3 percent of the Japanese students reported that they did not do any homework in mathematics.

When the homework variable is examined with respect to the extent of tutoring received, a different picture emerges, especially in Japan. Students report they work an average of 2.1 hours per week for the extra mathematics tutoring they receive. In comparison, United States students work an average of 0.4 hours per week for extra tutoring received in mathematics. Furthermore,

82 percent of the United States students said they had very little or no tutoring in mathematics. In Japan, however, only 37 percent of the students said they had very little or no tutoring in mathematics.

According to the Center for Statistics analysts, when the hours for tutoring and homework are combined, Japanese 7th grade students work an average of 4.7 hours per week on mathematics outside of the formal school. In comparison, United States 8th grade students average 2.9 hours per week for those same conditions.

Furthermore, Rohlen (1983) calls attention to newspaper accounts in Japan reporting empirical data that high school seniors spend an average of 7.5 hours per day over the summer vacation (doing homework) in preparation for post secondary entrance examinations.

In a series of interviews with principals, head teachers and subject matter teachers conducted in several elementary and lower secondary schools in Tokyo and Nagoya Japan regarding the question of the extent and amount of homework, Antonoplos (1985) concluded there was considerable variation (almost no pattern) in the amount of assigned homework by teachers in Japan. Some teachers assigned 1-2 hours of homework per week; some assigned twenty minutes; some did not assign any homework at all! However, the critical variable which emerged in these interviews and discussions was that students in Japan because of their own "gambura" (perseverance) did unassigned homework. That is whether homework was assigned or not, they did school work at home on their own, practicing diligently and learning solutions etc. to problems and mastering informational content. The fact that students are given their text-books in Japan further amplified this situation, especially over the summer months because many of them continued to review what they had been exposed to, and learn what had not been covered in the classroom. (Antonoplos, 1985)

The seriousness of the lack of homework on the United States side is further indicated by data from the National Assessment of Educational Progress (1985) in the following table ( )

Homework	1980 Percent of Students	1984 Percent of Students
Age 13: None assigned	30%	20%
Did not do it	6	3
Less than 1 hour	32	32
1-2 hours	24	26
More than 2 hours	7	8
Missing	1	12
Age 17: None assigned	31%	22%
Did not do it	12	11
Less than 1 hour	24	26
1-2 hours	22	26
More than 2 hours	10	13
Missing	1	1

Source: National Assessment of Educational Progress, The Reading Report Card: Progress Toward Excellence in Our Schools, 1971-1984, Educational Testing Service, Princeton, New Jersey, No. 15-R-01, 1985.

The importance of homework as a factor associated with educational achievement has been empirically demonstrated. According to the National Assessment of Educational Progress (NAEP), the extent of assigned homework has been increasing over recent years in the United States, and it appears that there is a positive correlation between performance in such areas as reading proficiency and the amount of homework a student does. This relationship is stronger at the 17 year old level than at earlier age levels. (NAEP, Reading Report Card, 1985), although it has been reported that at the 4th grade, 8th grade, and 11 grade levels, U.S. students who completed up to 2 hours of homework achieved above the national average in reading. Students who did not respond to homework requirements tended to be poorer readers. (NCES, The Conditions of Education, 1985 p. 55)

Selected Bibliography

Antonoplos, D. "Trip Report: Visit to Japan, Elementary and Lower Secondary Education in Japan." United States Study of Education in Japan, Office of Educational Research and Improvement, DOE, March, 1985.

Center for Statestics, The Conditions of Education, Washington, U.S. Department of Education , 1985.

Chen, Y. Y. "Time for Mathematics Instruction and Homework: A U.S. Japan Comparison." (Unpublished manuscript), Center for Statistics, Office of Educational Research and Improvement, DOE, 1985.

Fetters, W., Owings, J., Suter, L., and Taki, R. "Schooling Experiences in Japan and the U.S.: A Cross-National Comparison of High School Students. "Paper presented at the 1983 Annual Meeting of the American Educational Research Association, Montreal.

National Assessment of Educational Progress (NAEP) The Reading Report Card: Progress Toward Excellence in Our Schools. Educational Testing Service, Princeton, 1985.

Rohlen, T. Japan's High Schools. Berkeley, University of California Press, 1983.

Selected Bibliography

Burstein, L., and Hawkins, J. "An Analysis of Cognitive, Non-Cognitive and Behavioral Characteristics of Students in Japan," U.S. Commissioned Research, United States Study of Education in Japan, OERI, DOE, # NIE P-85-3036, February, 1986.

Comber, L. C., S. Keeves (1973) Science Achievement In Nineteen Countries New York; Wiley.

Flynn, J. R. (1983) "Now the great augmentation of the american I.Q." Nature, Volume 301, 24 February.

Husen, T. (1967) International Study of Achievement In Mathematics: A Comparison Of Twelve Countries New York; Wiley, Volume I, II.

Kodama, H., Shinagawa, F., Smoteki, M. (1978) Wechsler Intelligence Scale For Children - Revised, Tokyo; Nihon Bunka Kagakusha.

Lynn, R. (1977) "The intelligence of the Japanese" Bulletin Of The British Psychological Society 30, 69-72.

Lynn, R. (1982) "I.Q. in Japan and the United States shows a growing disparity" Nature, Volume 297, 20 May.

National Report of Japan: Volume 1. "Mathematics Achievement of Secondary School Students," Second International Mathematics Study, National Institute for Educational Research, Tokyo.

Rice, D. and Austin, L. (1983) "American Education: the ABC's of failure" Dallas Times Herald December 11-21.

Stevenson, H. W., Stigler, G. W., and Lee, S. Y., Lucker, G. W. (in press) Cognitive performance and academic achievement of Japanese, Chinese and American children. (paper made available by author: Stevenson to the U.S. Study of Education in Japan)

Stevenson, H. W., and Azuma, H. (1983) "I.Q. in Japan and the United States" Nature, Volume 306, November.

Travers, K., Crosswhite, F., Dossey, J. et al. Second International Mathematics Study, Summary Report for the United States, U.S. National Coordinating Agency, University of Illinois, Urbana-Champagne and National Center for Statistics, OERI Contract # 85210, May 1985.

Travers, K. "Eight Grade Math: An International Study, Principal, September, 1985.

Travers, K. "Mathematics Achievement in U.S. Schools: Preleminary Findings From the Second IEA Mathematics Study. Phi Delta Kappan, February, 1983.

Vining Jr., D. (1983) "Mean I.Q. differences in Japan and the United States" Nature, Volume 301, 24 February.

Wechsler, D. (1978) Wechsler Intelligence Scale For Children - Revised New York: Psychological Corporation.

Perceptions and Attitudes of Japanese Students

The Youth Affairs Administration, Management and Coordination Agency of the Prime Minister's Office, Japan conducts periodic descriptive surveys of the characteristics, attitudes and perceptions of Japanese youth and participates in international surveys of this nature with other industrialized countries. Empirical data, therefore, rather than conjecture is available and provides a unique view of Japanese student non-cognitive characteristics.

Youth Population Characteristics:

Of the total 120 million population of Japan, 43.5 million or 36.4% are youth between the ages of 0 to 24. In this youth population, males number 22.3 million and females 21.3 million. The male population is greater than that of the female youth population by more than one million at a ratio of 105:100. When the distributions are examined by age groups, the ten-year old group is the largest. The reason for this apparent concentration is attributed to the "Second Baby Boom" which followed the "First Baby Boom" after World War II. The distributions also reveal a sharp decline following the 17 year-old age group explained by a smaller birth rate in 1966. Trend data indicate that the youth population fluctuated between 40 million and 50 million since 1947. The ratio of youth to the total population then changed significantly. In

1950, it attained a ratio of 55% of the total population and since then has consistently declined each year to 36% of the total population as of 1983. Because of this, Japan is now described as a country with a small ratio of youth population. (The Prime Minister's Office: The Rising Younger Generation in Japan '85, March, 1985).

The following empirical data reported on youth perceptions and attitudes regarding: outlook on life and society, family, schooling, problems and influences, was made available by the Prime Minister's office of Japan and the Japanese Embassay, Washington, D.C. It is remarkably objective in reporting responses as obtained from Japanese youth in comparison to other participating nations in the surveys represented. Where inferences are offered, they represent conclusions of the Prime Minister's staff responsible for the surveys, and are so identified. Where inferences are suggested by this author, they will be underscored.

Outlook on Life and Society

In a survey conducted of eleven nations by the Japanese Government, Japanese youth responded to the question "what do you want most out of life?" with the answer, "sincerity and love between myself and others" and in response to the question regarding "mans nature?", 33% of these youth took the fundamental position that man's nature was essentially "bad" (evil). This was notably the largest percentage of any of the eleven nations. In response to the question: "would you speak to a stranger who had lost his way and needed help?", at 31.9%, Japan was the lowest of the nations who would speak to a stranger to be helpful. According to Naka (1977) Japanese youth "are lacking in spirit of positive helpfulness toward others. When dissatisfaction with society is considered, a great number of Japanese youth in comparison to those in western countries complain of a tendency in Japan to produce "sterotype men, who act as they are told." (Naka, 1977, p. 39)

Dissatisfaction with society may be further indicated by the extent to which Japanese youth appear to value their country. In response to the question: "are you prepared to sacrifice your own interest for your country?" The Japanese ratio of 16.3% was the lowest among the participating countries. In comparison, the United States was among the highest, 60.0% responding affirmatively.

In response to the question "are you proud of your country?", 70% of the youth in Japan responded affirmatively, while 100% in the United States responded as such. However, in response to the question: "would you like to do something useful for your country?", the majority of the western nations including the United States (80%) responded yes, while only 40% of the Japanese youth expressed positive inclination or interest. In fact, the ratio of "society-oriented responses" was lowest among Japanese youth, 36.5% (next to West Germany 27.9%, the lowest) while youth in the United States at 55.5% was the third highest in society orientation among the nations participating in the survey. (1984, Outline Japan's Third World Survey)

Youth across the comparison countries have preferred life styles. A high number of youth in general, report they "want to live as they please including Japanese students at 40% - 50%. The next most desirable life style reported by Japanese students was "I want to be affluent" at 38%. The number of students identifying "having social status", or to contribute to society received the lowest ratings by Japanese students. In fact the intention "to contribute to society" received the lowest ranking by Japanese students of all the comparison countries. (1984 Outline Third World Survey)

Regarding the question of "happiness" in most countries, youth reported they "feel most happy" when "I am with my family." In Japan, the number choosing this alternative was small and the number choosing the alternative "to

contribute to society" was lowest in Japan in comparison to the USA and other countries. (1984 Outline Third World Survey)

Perceptions of Parents and Satisfaction With Home Life

In the 1984 Third World Survey conducted by the Prime Minister's Office, the comparison nations included: the United Kingdom, France, the Republic of Germany, Switzerland, Sweeden, Korea, and the United States. The sample surveyed included approximately 11,000 youth.

Although Japanese youth were in the middle of the comparison distribution on the extent of "disagreement between self and parents, since the previous survey conducted by Japan, the incidence of "serious disagreement" gained from 15.8% to 19.2%. The areas of disagreement reported across all the participating countries were primarily reported in the "outlook on life" category and "relationships with the opposite sex."

Japanese students differed from others in regards to the ideal image of "father" and "mother."

In most of the countries represented, 70% - 90% perceive the role of the father as one who places "family before job." In Japan, this perception of the father was less acceptable at 48.2%. The "job father" who "puts his job before home and family" was more popular, in Japan. Since the last survey, the Prime Minister's Office has noted a decrease in the popularity of the "job father" from 33.0% to 22.6%. A permissive father who "lets children do what they want to do was most acceptable to Japanese students but not to students from western nations." Furthermore, Japanese students identified the dominating type of father as the most unacceptable among all of the countries surveyed.

With respect to the role of the mother, the "friendly mother," was expressed as most favorable in all the countries at a response rate of 90%, however, the "strict mother," was more popular in Japan than in the United

States and in Western European countries. In Japan, the "permissive mother" ("who lets her children do whatever they want") at 59.1% was the highest of all the participating countries, and the "dominating" mother was rated as least popular by Japanese students.

Among the countries participating in the Third World Survey, general satisfaction with homelife was rated high at about 90% with the exception of Japan (and Korea) where it ranged in the 70's. The reasons offered by Japanese students were:

- o "parents don't understand me;"
- o "too much tension at home;" and
- o "don't have enough income."

Differential relationships were reported with parents by Japanese students. These were described as "not to bad" with mother, however, relationships with "father" were described as thin or shaky. Among those not getting along with parents in Japan, the highest number were characterized by lower and upper secondary school students. The Prime Minister's Office concluded from the data, that the proportion of dissatisfaction with home life increases with the age of students.

In an examination of the extent to which students participate in "joint activities with parents" reported (by parents) in the Survey of International comparisons on Youth and Family, 1982 by the Prime Minister's Office, Japan, Japanese students were second from the bottom in reported participatory activities with parents. The activities included: indoor games, 27.4%, walking sports, 41.2%, cinema theater, 11.7%, travel, 34.6%. (Note: According to this international survey, the Japanese received the lowest participation scores on the extent to which parents see themselves as a "valuable help with studies.")

Compared to Japanese students, Students from the United States ranked high on the participation with parents variables with the exception of "walking sports" which they ranked fourth internationally. Furthermore, when asked:

"whom do you consult regarding your troubles and worries?", Japanese students rate friends highest at 52.9%, mother second at 35.7%, colleagues third at 17.9% and father fourth at 17.8%.

In contrast, United States students rank: mother first at 58.9%, brothers and sisters second at 39.9%, father third at 35.1% and friends fourth at 27.1%. (Notably, Japanese students rank brothers and sisters last among the response categories at 15.1%) (source: 1984 Outline, Third World Survey, Prime Minister's Office, Japan)

Problems of home and family discipline reported by parents reflecting some differences in parent perceptions of student characteristics between Japan and the United States are evident in the following table:

Problem	Percent Response Japan	Rank	Percent Response USA	Rank
Do not study	14.4	1	12.4	3
Disobedient	10.3	2	14.2	1
Not clear what children are thinking of:	9.4	3	13.2	2
At loss, how to discipline	8.3	4	8.6	5
Matters to do with children's friends	5.3	5	10.9	4
Inconsistencies in parent/ school discipline	3.1	6	8.6	6
Parents reporting having children with problems:	42.1%		28.8%	
Problems attributed to mother's employment	57.7%		28.8%	

Source: International Comparisons on Youth and Family, Prime Minister's Office, Japan, May, 1982.

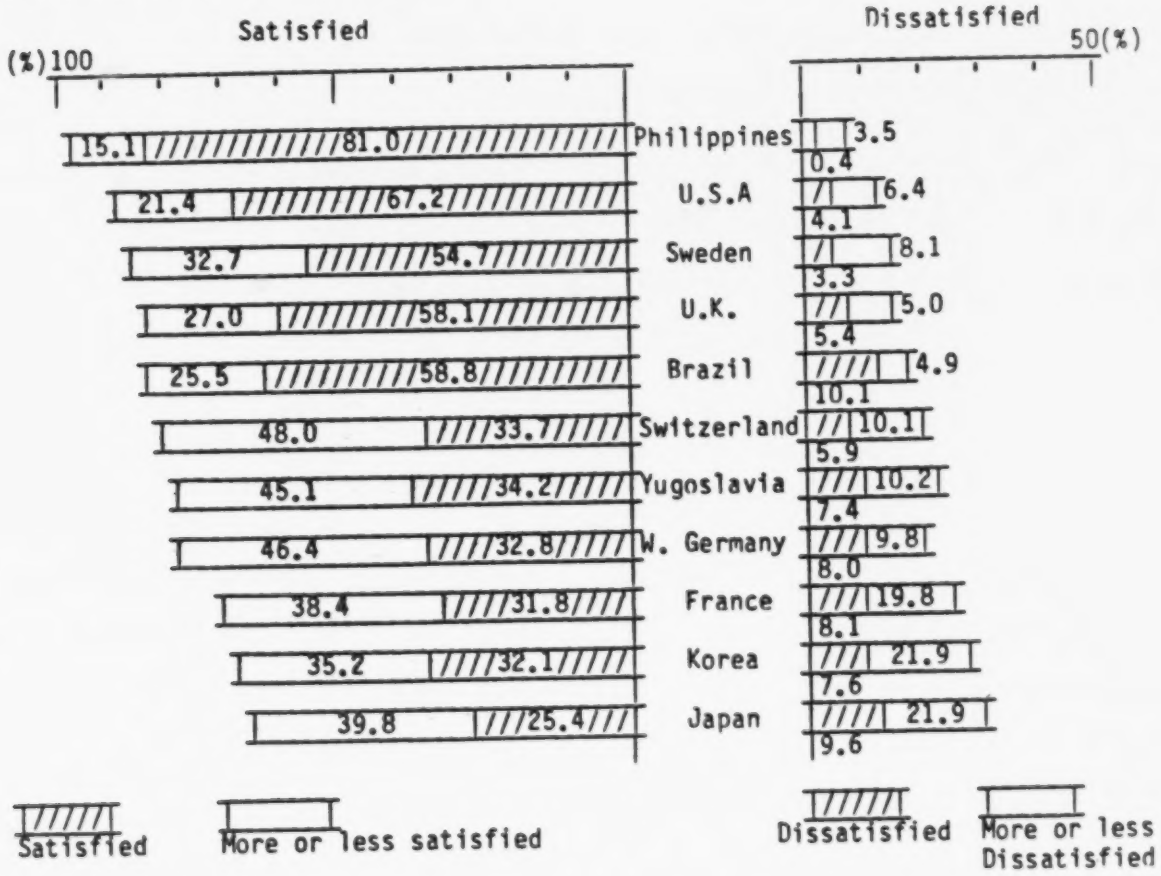
The data on problems of home and family discipline indicate that Japanese and American parents tend to he in agreement on three very pressing problems: motivation to study, disobedience and parental understanding of "what children are thinking of." It is also apparent that Japanese parents rank the importance of motivation to study (rank 1) higher than do American parents, (rank 3) demonstrating in an empirical since, parental concern with achievement orientation and its primary role in child behavior. Of noteworthy attention in the table, are differences in "inconsistencies in parent/school discipline" reported by parents in Japan (3.1%) and parents in America (8.6%). Although the rankings are similar, the data suggests this is much less of a problem in Japan than it is in the United States.

Furthermore, more Japanese parents report having children "with problems" (42.1%) than do American parents (28.8%) and a higher proportion attribute the etiology of these problems to "mothers employment (57.7%) in Japan than in the United States (28.8%). (1982, Prime Ministers Office, Comparison Youth and Family, Japan)

Attitudes Toward Schooling

According to the recent 1984 Third World Survey, Prime Minister's Office, Japan, general satisfaction with school life characterized most of the participating countries with the exception of Japan. The satisfaction ratio was lowest in Japan of all countries at a combined satisfaction index of 65.2%. In contrast, the reported percentage of satisfaction with school life of American students was 96.1%. The following table indicates the percentages of "satisfaction" and "dissatisfaction" among the nations participating in the survey:

Satisfaction with school life



Source: The World Youth Survey, Management and Coordination Agency, Prime Minister's Office (1984)

In an examination of the elements of satisfaction with school life, it was noted that Japanese students reported they were more satisfied with "friends and clubs" (over 50%) than with "lessons" "teachers," and classroom atmosphere, (30.%). Comparative data for other countries including the United States was not available on these variables. (1982, Prime Minister's Office, Outline White Paper on Youth, Japan)

It has been concluded that the dissatisfaction of youth in Japan to some extent reflects their perceptions of inherent archaic values or "the old fashioned

characteristics of schools" which according to Naka, a large number of Japanese students compared to those in other nations complain. (Naka, 1977, p.39)

The proportion of students reporting they had gained "general knowledge," "basic knowledge" and found "close friends" in school was high in all countries. However, the proportion of Japanese students identifying finding "close friends" increased significantly from the previous survey (42.3% to 52.9%) suggesting to this author, an emerging peer group orientation and cohesiveness beyond the general "group membership" encouraged by Japanese schooling. (1984 Prime Minister's Office, Third World Survey, Japan)

In addition, "when I am with my friends" was the response rated highest by Japanese students to the question: "when do you feel most happy?" the increasingly emotional investment in "friends" by Japanese students was also indicated by the response of Japanese students to the question: "whom do you consult regarding (your) troubles and worries?" The results of Japanese students compared with American students were:

Japan	Friends	48.9%
	Mother	35.7%
USA	Mother	58.9%
	Brothers & Sisters	39.9%
	Friends	27.1%

Source: 1984 Third World Survey Prime Minister's Office, Japan

The data challenge previous conceptions of Japanese youth reported by Vogel (1955) that youth place family relations first more often than any other activity, and call attention to Cumming's assertion of a distinct "youth stage" in Japan similar to that in Western societies. This author concludes that this may not be a "stage" as envisioned by Cummings but appears to be emerging youth culture with unique psychodynamic charateristics unlike that of western societies on varables described in this report. Furthermore this "youth culture" is beginning to challenge the very fabric of Japanese society.

The desire to continue learning after school was higher in Japan than in the United States and European nations at 88.0% responding affirmatively. In most countries including Japan, students rated "personal efforts" (first) and "personal ability" (second), as the key factors explaining success in school. In Japan, the proportion of those attributing academic success to "educational background" was very low (7.8%). Attributing academic success to "luck or chance" was also suprisingly higher in Japan than any of the other participating nations. (47.3%) (1984, Prime Minister's Office Third World Survey)

With regards to subject matter, or teaching content, 44.1% of Japanese high school students report they "can keep pace with all lessons," while 52.3% reported they cannot keep pace with particular learning material.

26.2% of fifth and sixth graders, in a sample of Japanese elementary and lower secondary schools claim to be able to understand "almost all" of the lesson contents; 40.3% report being able to understand approximately two thirds of the lesson contents; 27.4% "can understand about half;" and 5.5% of these students report they can understand about one third of the lesson content or "can understand hardly anything." (Prime Minister's Office, Outline of 1982 White Paper on Youth p.5)

Problems of Youth

In Japan, the Juvenile Law specifies that youth under twenty years of age are given differential consideration as juveniles when they have committed crimes "different from the adult crimes." (Prime Minister's Office, 1985)

In the year 1983, Juveniles "receiving guidance from the police" for criminal acts as defined by the criminal law were 196,783 (18.8 persons per 1000 same age population). Excluded from there crimes was manslaughter due to negligence.

This ratio was 6.5 times larger than crimes for adults.

The following kinds of youth criminal offenses were reported:

- o Theft accounted for three-fourths of these offenses. The highest ranked was "motorcycle and bicycle theft" followed by "shoplifting". Examined by age group 14 and 15 year olds were the most prevalent offenders. It appears from the data that these kinds of offenses in Japan diminish as students get older. When analyzed by gender, males accounted for 79.2% while females accounted for 20.8%.
- o School and family violence.

  The second major category identified by the Prime Minister's Office, Japan, were the "current problems" of school and family violence. School violence is defined by Japan as "the term for accidents occured at lower and upper secondary schools against teachers and fights among students or demonstrations of group dignity as well as destruction of school facilities and equipment. Also included are out of school violence crimes whose causes and motivations were closely related to the school." (Prime Minister's Office, 1985, The Rising Younger Generation in Japan).

The proportion of school violence cases attended to by police was about 2,125. It was reported that "guided students" numbered 8,751 in 1983. The data examined by school level showed that most of the infractions (2,035) were committed by lower secondary school students, and supports other data (secondary source accounts) of the greater frequency of problems at the lower secondary school level.

According to the Prime Minister's Office, Japan (1982) school violence included destruction and dirtying of school property, and acts of bullying the weak and ostracizing classmates. These acts occur in about 60 percent of lower secondary schools in cities. The reasons cited were: to retaliate against warnings and severe discipline reactions to school discipline policy and ways of conducting lessons (9.8%) and to show off (6.7%). (Prime Minister's Office, 1982, White paper on Youth)

Many writers in the popular press, and some scholars attribute these problems to stress and anxiety caused by the examination system or "examination hell," and the pressures to perform and be selected by the best schools.

This author believes that the incidence an quality of youth problems and delinquency in Japan along with some of the previous attitudes and perceptions of Japanese students described may be indicative of a complex emerging pathology and desire for individualism and freedom in Japan. Freedom from the traditional values, family patterns and educational pressures and an emerging pathology due to stress and anxiety typical of societies that have undergone a high degree of industrial sophistication.

Suicide of Youth

In 1983, there were 657 cases of suicide among the youth of Japan. Of these cases, 452 were males and 205 females. Suicide was reported highest

among 19 year olds (201 cases) or 30.6 percent of the total. From this age downward the proportion is less.

According to the Prime Minister's Office (1985)

> "school problems such as bad achievement or suffering from entrance examination pressures accounted for 26 percent, family problems such as unharmony with parents 13.9 percent, problems between boy and girl like loss love, parents disagreement to marriage 11.0 percent, sickness problems like physical inferiority complex or those caused by illness 11 percent, and psychological problems 16.1 percent." (The Rising Younger Generation in Japan, 1985)

In his analysis of suicide rates in Japan by seasons, Rohlen has concluded that school maladjustment, not the pressures of entrance examinations appear to be "the more powerful education-related factor" affecting youth suicide. The data offered by Rohlen on suicide rates in his book, Japan's High Schools, 1983 is considerably out of data, (1950-1978), however, his logical argument regarding seasonal correlations is quite convincing. Ichikawa, (1984), based on Watabe, (1979) has concluded:

> "...in actual fact, young people (aged 15-24) do not commit suicide very often in Japan. The ratio of juvenile suicide recorded the fifth highest figure among 48 countries in 1976, but the figure adjusted by the frequency through all ages (=frequency by the youth divided by that by the whole population times 100) ranks 25th below the United States and moreover, as regards children (under 15 years old) Japan ranks in the middle of those 48 countries. The impression of high ratio of juvenile suicide in Japan is based on the old data from the 1950's when the competition in entrance examinations had not been overheated.

Selected Bibliography

Ichikawa, Shogo. "American Perceptions of Japanese Education" (unpublished manuscript) National Institute for Educational Research, Tokyo, August 1984.

Naka, Hisao 1977, Japanese Youth In A Changing Society, Tokyo, the International Society For Educational Information Inc.

Prime Minister's Office, 1984, Outline Of The Results Of The Third International Survey Of Youth Attitudes, Foreign Press Center, Japan.

Prime Minister's Office, 1984, The Japanese Youth In Comparison With The Youth In The World: A Summary Report Of The Third World Youth Survey. Youth Development Headquarters, Japan.

Prime Minister's Office, 1982, International Comparisons On Youth And Family, Foreign Press Center, Japan (May).

Prime Minister's Office, 1982, Outline Of White Paper On Youth, Foreign Press Center, Japan (December).

Prime Minister's Office, 1985. The Rising Younger Generation in Japan, Youth Development Office, Tokyo.

Rohlen, T. P. Japan's High Schools, Berkeley, University of California Press, 1983.

Watabe, Makoto. "An International Comparison of Suicide in the Adolescence," Journal of Educational Sociology, Japan Society of Educational Sociology, Volume 34, 1979.

LEARNING IN JAPAN

The process of education and the art of learning in Japan has had many influences that have combined traditional oriental conceptions of child development with selected Western influences. The period from the mid-17th to the mid-19th century was a time when direct Western influence in child-rearing and education was minimal and selective Chinese influence was dominant. Japanese scholars of the period maintained that children are innately good rather than evil: that environmental factors rather than innate ones produce developmental differences among human beings; and that children are active autonomous learning beings rather than passive to experience. The environmental perception of child development and the view of the child as an active autonomous being incorporated the belief that the child was difficult to control directly by external means. Child development and learning goals were, therefore, related to the maintenance of harmonious human relationships, character development through moral education and faithful and responsible performance to one's tasks.

The essential techniques of training were to observe children's maturation and provide age relevant tasks for them. Although many writers stressed the importance of early training, they carefully meant training compatible with the readiness of the child.

In addition stressing the importance of moral education, self-responsibility, and perserverance, the Japanese have been found to be selective in how they adapted and assimilated Western theoretical influences. That is, both Japanese educators and the general public demonstrate interest in introducing new techniques and methods of education. Japanese professors are adept and knowledgeable in discussions

of various Western theorists and their theories of learning, psychology and education and often describe their positions as eclectic. However, theories of psychology and education which require individualized and differential treatment of children still remain at the laboratory research level in Japan.

It appears that the highly competitive selection and examination system used by schools in Japan after the Meiji Restoration and expecially after the 1960's has precluded the dissemination and use of new educational philosophies which are individualistic and innovative for teaching and learning.

Although there are always some differences in approaches to learning by different teachers, the basic characteristics of typical teaching and learning utilized in present day Japan include:

- o readiness-paced early training in concentration and precision as reflected in the establishment of school learning routines and music teaching.
- o teacher-directed, structured and sequenced learning activities in subject matter rather than student centered.
- o lecture method oriented toward the transfer of factual information and the elements of solution rather than creative discovery and general problem solving strategies.
- o a group approach to learning for identification with others, socialization, cooperation and uniformity rather than individualized approaches to behavioral and social development.

MOTIVATION

In Japan, careful attention is focused on the individual child's motivation and attitudes toward subject matter and competence in basic skills. Both teachers and parents draw on a large cultural reservoir of concrete didactic methods for development and for encouraging children's motivation and learning skills. During the initial period of early learning, some of these practices include:

- o parental and teacher calculated inflation of learner motivation for some period of time before training begins.
- o ritualized overdetermination and repeated practice of basic learning routines until they become habits.
- o training in concentration, focus and precision.
- o development of self-monitoring of the learning performance.
- o Cultural expectations, and socialized needs for uniformity and group membership as well as the external pressures of the school selection and examination system appears to provide the additional impetus for motivation and achievement orientation through the additional secondary school years.

DISCIPLINE

Japanese schools vary to some extent on the existence of discipline problems, especially in the few areas designated by some concentration of minority group students (Burakumin). In typical Japanese elementary and secondary schools, the level of order and behavior is very high, often balanced by a friendly atmosphere and without the use of unnecessary authority.

In the early years, individual discipline problems are handled in the group situation utilizing group dynamics and encouraging the individual to be a responsible and fitting member of the group. In this atmosphere, when the individual deviates, the group suffers until the individual conforms to expectations and regulations.

Instruction in moral education, homeroom guidance and other activities serve to reinforce appropriate "uniform" behavior throughout elementary and lower secondary years. The rudiments, probabilities, and civilities appear to be established early resulting in fewer discipline problems at the secondary level than in many western countries.

THE CURRICULUM IN JAPAN'S EDUCATIONAL SYSTEM

Daniel P. Antonoplos

INTRODUCTION

To understand the educational system of a society, one must be able to relate schooling to the cultural, economic, historical, philosophical and political circumstances of the lives and ideas of people at a particular time and place. These factors provide the influences that shape the manner in which schooling is valued and held to accomodate the purposes of education. Among the major functions of schooling of various societies are included the transmittal of the cultural heritage and/or the facillitation of social improvement and change. It is through the nature, quality and pervasiveness of the educational curriculum that these purposes are actualized and values find their expression.

Inherent in the Japanese educational framework are certain salient features embedded in the culture, philosophy, family and social group that influence goals, expectations and the conduct of education. These features or conditions include:

- o A homogeneous, monolingual culture where expectations of uniformity are the rule, diversity the exception egalitarianism and standardization the goals and achievement through perserverance, the expectation and objective.
- o A fluid linguistic system having no strict orthography held by some scholars (Aso, Amano 1983) to have the effect of contributing to the reduction of illiteracy and assisting in the spread of general education throughout Japan.

- o A belief in success based on effort and perserverance rather than innate ability; a positive conception of man's changeability through education; and a perception that the criteria of success can best be achieved through education (Aso and Amano, 1983).
- o A "whole person view" philosophy encompassing intellectual content, moral character, social cooperation, physical and artistic development though balance among the curricular areas and depth of attention to the learning material.
- o A strong drive for national achievement to secure a position among the leading countries in the world, economically, technologically, politically and educationally.

THE STRUCTURE OF THE EDUCATIONAL CURRICULUM OF JAPAN

Antecedents

In a research study sponsored by the United States Study of Education in Japan Beauchamp (1985) has noted in a synthesis titled: Japanese Education And The Development of Postwar Educational Policy, 1945-1985 that:

The educational structure of Japan has been emphatically influenced by two major reform movements since the Meiji Period (1868-1912), or the end of the fedual period in Japan. The first major reform took place in 1868-1830, when a western like school system was implemented for the purpose of modernizing the country. During this time the Imperial Charter Oath of April 6, 1868, required the citizenry to abstain from their old-fashioned ways and directed that "knowledge shall be sought throughout the world." In order to accomplish this directed goal, the Meiji reformers borrowed the most appealing features of several western educational systems and assimilated them into the Japanese conditions. This led to the emergence of a very centralized administrative structure focusing on state operated normal schools borrowed from France; a system of higher education located in a restricted number of elite public universities mirrored from Germany; character-building institutions stressing moral discipline, exemplanry of the English schools and a system of elementary education, and a orientation toward vocational education similar to the United States.

Reactions to the Meiji Restoration, however, were quick to highlight that certain Western ideas were not entirely functional in the Japanese cultural context, e.g., Western conceptions of individualism. By 1880, a general attitude was evident that the reforms of the previous decade had been to excessive.

The need was expressed to return to traditional values characteristic of Japanese philosophy, e.g. Confucianism and its focus on cultivating relationships among members of society, developing committment, loyalty, and trust, rather than encouraging the development of critical and dissenting attitudes.

According to Beauchamp (1985) the success of the Meiji educational reform was reviewed by former U.S. Ambassador to Japan, Edwin O. Reischauer who concluded that the Meiji approach was "closely tailored to national needs as the leaders saw them. It created a literate mass of soldiers, workers, and housewives, ample middle-level technical skills-an aspect of education that many of today's modernizing countries have failed adequately to appreciate and a thin stream of highly talented young men emerging from universities to occupy positions of leadership in government and society." (Beauchamp, 1985, Reischauer, 1977:169)

In the beginning of the Meiji Era, a modern educational system was therefore created through which elementary education offering fundamental education to all the populace and higher education for the training of leaders initiated the modernization of Japanese society and the Japanese economy. By the beginning of the 20th century, enrollment in compulsory education exceeded 90 percent. As a result of the growth of elementary education, secondary education was promoted along with the development of vocational and women's education. The following table presents the historical trend in the percentage of the appropriate age groups enrolled in each school level. (For convenience in analysis, secondary education is not divided into lower and upper levels.)

	Elementary Education %	Secondary Education %	Higher Education %
1875	35.2	0.7	0.4
1885	49.6	0.8	0.4
1896	61.2	1.1	0.3
1905	95.6	4.3	0.9
1915	98.5	19.9	1.0
1925	99.4	32.3	2.5
1936	99.6	39.7	3.0
1947	99.8	61.7	5.8
1955	99.8	78.0	8.8
1965	99.8	83.8	14.6
1970	99.8	89.2	18.7
1975	99.9	95.2	30.3
1980	99.9	96.5	33.5
1981	99.9	96.5	33.3

Source: Curriculum in Japan, Country Report, 1985, Presented by Japan at the International Seminar: Core Curriculum in Western Societies, Enschede, the Netherlands, November 13-15, 1985

The Second Reform Movement Pre-World War II Japan was oriented toward obedience and loyalty to the Emperor, the articulation of moral values as prescribed by Japanese society and group harmony and equilibrium. The Second Reform stimulated by the United States Education Mission during the MacArthur period began the "democratization" and "decentralization" of Japan's centralized orientation into a system focusing on reducing the powers of the Ministry of Education and expanding local community control.

According to Beauchamp 1985, elements of the Second Reform Movement such as co-education, comprehensive schools and local control were ingrained in the "American democratic model" but were "dysfunctional when imposed on the Japanese educational cultural setting. These efforts, however, became the basis for a series of educational laws established between 1947 and 1949 that included: "The Fundamental Law of Education" and the "School Education Law."

As American control was withdrawn in 1952, it appeared that the Japanese had adopted American democratic ideals, new curricula, textbooks and new methods. However, as Beauchamp (1985) noted, the Japanese re-established their own sovereignty, and discarded and changed many of the Occupation imposed reforms.

In short, the 1950's were illustrative of Japan's establishing control over education according to Japanese cultural values in favor of more traditional forms of centralization; re-instituting a powerful Ministry of Education and returning moral education to the curriculum. This was accompanied at this time by a new orientation toward industrial demands for a stronger focus on science, technology and vocational readiness in the schools. In Beauchamp's words:

> "the period of the 1950's was characterized by the consolidation of many occupational reforms, the rejection or modificiation of others that were dysfunctional with the unique Japanese context and the laying down of the broad outlines of educational policies that would be pursued during the 1960's and 1970's. (Beauchamp, 1985, p.29)

The period of the 1970's and the beginning of the 1980's serve as the anteceedent period for Japan's current educational reform period under the direction the Ad Hoc Council on Educational Reform established in 1984. The issues regarding this reform movement are discussed under another section of the United States Study of Education in Japan.

Notable Characteristics of the Japanese Curriculum

- o Demanding Nature of the Curriculum

  According to Cumming's (1980) p 10, the educational curriculum of Japan is demanding encompassing a wider range of subjects and treats subjects in greater depth than the curricula of typical U.S. schools. This subjective impression based on Cummings' observations in Japanese schools has been verified by: observations of other scholars, e.g. Rohlen, and empirical studies such as the IEA High School and Beyond Study and an Analysis of Mathematics textbooks in Japan and the United States sponsored by the U.S. Study Group.

- o According to Rohlen, 1983, p 160

  Japanese youth attend school about 60 more days each year than American youth, when the United States - five day school week is used as the criterion, for the Japanese approximates three months per year of additional schooling. In fact, when calculated across the twelve years of elementary and secondary education, the Japanese students actually obtain four more years of schooling than their American counterparts. There is also an added value of the Juko, support system to this equation of instruction and schooling time.

- o The usage of time is segmented and defined in the curriculum. It is considered "precious" and order and social organization is reinforced. Although a quasi-relaxed atmosphere is often maintained, there is a mimmum if any of distractibility and attention and student focus on instruction is paramount (Rohlen, 1983, Antonoplos observations in Japan).

- o A part from time spent in school and un-interupted class time, Japanese students spend almost twice as much time on homework in mathematics when the hours for homework and tutoring are combined.

- o The Course of Study of the Japanese curriculum at the elementary, lower secondary and secondary levels is standardized, comprehensive and of wide range and balance. Several hundred goals and objectives covering grade levels cognitive effective and behavioral and subject areas are uniformly provided to teachers to govern and plan instruction. In spite of their comprehensive nature, school officials interviewed by the U.S. Study Team reported that they considered these minimum requirements and went beyond their prescription in planning educational experience and instructing their students. (Antonoplos interviews Japan)

- Textbooks: Early Introduction of Math Concepts.

  Mathematical concepts at the elementary level are introducted earlier in Japanese textbooks than in American textbooks. In 38% of the cases, mathematical concepts at the elementary school level appeared earlier in Japanese textbooks than in American textbooks. Concepts appearing earlier in Japanese textbooks than in American textbooks included: "addition," "subtraction," "decimals" and "dimensions of solids," "decimals and fractions" "time," "money," "relation of circle and sphere," triangle, "discussion of the square" "rectangle" "polygon," rhombus, parallelogram," and "calculation of areas."

In most cases, concepts appeared two or more semesters in the Japanese than in the American elementary textbooks. (Stevenson, 1985, U.S. Commissioned Study).

- According to U.S. Study Group researchers, the "curricula" contained in the elementary school textbooks are somewhat more advanced in Japan than in the United States. In addition because of the earlier appearance of concepts in the Japanese textbooks, children are afforded learning opportunities to practice the skills associated with the concepts. (Stevenson, 1985, p. 118. U.S. Commissioned Study).

- Secondary School Textbooks. 7-12

  Mathematical textbooks in grades 7-12 in Japan tend to be more abstract than American textbooks. In Japan, there is less emphasis in placing problems in everyday settings. "Japanese textbooks present the essence of the lesson with the expectation that the information will be elaborated and supplemented with other material when it is presented in class by the teacher. American textbooks appear to be written so that understanding the content of the lesson is less dependent upon what happens in mathematics classes." (Stevenson, 1985, p. 30).

- Mathematical Concepts at the Secondary school level are introduced earlier in Japan than in the United States. Of the 276 concepts identified, 41% appeared two or more semesters earlier in the Japanese textbooks than in the American textbooks. 27% appeared two or more semesters earlier in American textbooks. Researchers for the U.S. Study Group concluded that the advantage of early mathematical concept introduction in Japan is often a year or more in length, and that the earlier introduction of concepts may allow for greater opportunity for practice and achievement performance.

SCHOOL GUIDANCE AND MORAL EDUCATION IN JAPAN

> In the United States, guidance through the elementary and secondary levels is typified by systematic services provided to pupils that include counseling, testing, provisions for occupational and educational information, college placement and referral for diagnostic purposes and serious emotional disturbances. These services are usually provided by specialist with at least a masters degree within the organizational framework of a school guidance department officiated by a qualified guidance director and a number of counselors appropriate to the size of the school. (Antonoplos, D., U.S. Study of Education in Japan)

In contrast, Guidance in Japan is approached quite differently, for different purposes and yet with some similar features and results.

Antonoplos (1985) conducted interviews in Japan with principals, assistant principals and head teachers at the elementary, lower secondary and upper secondary levels as well as supervisors at a major prefectural education center to obtain a view of the contenance of guidance in the schools of Japan. These institutions included: the Minato Ward Aoyama Elementary School; the Nagoya Municipal Asahigaoka Elementary School; the lower secondary and upper secondary schools of the University of Tsukuba; the Nagoya Municipal Secondary School; the Gakushuin lower and upper secondary private school; and the Aichi Prefecture Education Center. The observations provided represent a synthesis of these interviews and discussions.

The responsibility for administering guidance in the schools of Japan clearly rests with the homeroom teacher who commits approximately 2-4 hours a week for the performance of this function. The characteristics of guidance are first and foremost inextricably woven with the monitoring of student behavior in the learning situation, classroom and in school activities. At the elementary and lower secondary education years,

guidance is an integral part of the moral education atmosphere of the school. Upon noting deviations in the expected patterns of uniformity and the moral education goals of the school, the teacher advises the student on appropriate conduct, improved motivation and self responsibility. Because of this, it is "the responsibility of the teacher to be sensitive to changes in student behavior in learning, doing homework, respect for others, and attitudes toward group membership." In this manner, a prime function of guidance "to impart social rules to students and the reinforcement of those rules when necessary is accomplished."

Moral Education

The Courses of Study of Elementary and Schools and Lower Secondary Schools in Japan have specifically stated that the objective for moral education--"is aimed at realizing the spirit of respect for human dignity in the actual life of family, school and community, endeavoring to create a culture that is rich in individuality and to develop a democratic society and state, training Japanese to be capable of contributing to a peaceful international society, and cultivating morality as the foundation there of." (Ministry of Science Education and Culture 1983)

As an example, the contents of the curriculum course of study at the elementary school level include the following objectives:

1. "To hold life in high regard, promote good health and to maintain safety.
2. To observe good manners and to live in an orderly manner.
3. To keep one's self neat and tidy and to make good use of goods and money.
4. To respect another's freedom as well as one's own and to be responsible for one's own acts.

5. To endure hardship and persist to the end for the accomplishment of one's right aims."

With regards to the teaching content the standardized course of study states:

> "it is desireable that in the lower grades, one should learn to love justice in one's own frame of mind and in the middle grades to distinguish between justice and injustice and to overcome temptation and in the upper grades, to carry out correct actions positively with courage."

Furthermore, teachers are advised to emphasize the correlation of moral Education and each class subject and special activities in the preparation and conduct of their teaching programs.

The importance of moral education in the uniformity of behavior according to expected social rules is further amplified in the curriculum of the school in moral education classes which in grades 1-6 usually meet about once a week. It was reported to the Study Group that most elementary schools had about 35 themes that included instruction on: "brotherhood," "community love," "love toward human beings," and "respect for others." At the lower secondary level, these moral education classes focus more on the spiritual and moral aspects of life in general rather than specific behaviors. When asked how students were evaluated in this setting, the reply was: "by the compositions they write on the topical areas covered and how they behave on a daily basis in the classroom and in school activities.

For problems which homeroom teachers are unable to handle, such as more serious behavior problems, many schools have "guidance teams." These "guidance teams" consist of five or six experienced teachers in the school, appointed by the principal to serve in an advisory capacity to

homeroom teachers on guidance problems. It was made quite clear, however, that the emphasis of responsibility for the provision of guidance is on the homeroom teacher.

The nature of problems range from social behavior, following the rules of the school, completing homework and individual motivation, to serious emotional problems and physical problems.

When problems appear to be beyond the capability of the school, e.g. serious emotional disturbance, evidence of mental retardation and the need for diagnosis, and testing, the school refers the student to either the Municipal Education or the Prefecture Education Center depending upon school location.

The Prefecture Education Center's provision of services to schools is discussed in another section of this report. (educational setting section) With respect to guidance, counseling, and special education, the Center holds counseling sessions on special education; gives advice to parents and teachers concerning school choice and treatment for handicapped students. Although advice is provided to parents, the clients are limited to infants and students who are suffering from weak sight, auditory disturbances, speech impediments, emotional disturbance and other physical and emotional handicapps.

It was reported to Antonoplos (1985) by the Supervisors of the Aichi Prefecture Education Center that a total of 300 counseling sessions were held by counselors for the year 1984. These problems included: emotional maladjustment, identification, diagnosis and testing of mentally retarded students and school achievement problems.

It is important to note that these centers are staffed by Supervisors and specialist who have at least ten years of experience as teachers and are hired by the Prefecture in their area of speciality. In addition medical personnel is provided as needed.

Guidance in-service training is provided to teachers by the Prefecture Education Center under specific "seminar guidelines" established by The Ministry of Education, Science and Culture (Monbusho). Teachers are eligible for guidance seminars only after they have had five years of teaching experience. The duration of this initial in-service training is six days at the Prefecture Education Center.

With respect to other kinds of problems, for example, learning disabilities, it was reported to the Study Group that each class has 3-4 learning disabled children. In Japan, these children are served by encouraging them to stay after class for individual assistance by the teacher. In addition, the teacher gives these children easier daily classroom assignments than the rest of the class. Academic achievement, the measurement of that achievement (testing) and academic placement, e.g. college and vocational school placement is of upmost importance to parents and students in Japanese society. Although the school plays a significant role in the preparation for entrance examination to the universities, etc. it is the Juku, the informal school system that appears to play a significant role not only in remediation and enrichment of examination skills but provides the "testing industry" for determining the skill levels of students in relation to the array of college, universities, jr. colleges, and technical schools this testing demonstrates they show qualification for. It was reported to the study Group by one

Juku that 1 million students were tested to determine their skill levels in one year. They and their parents were advised regarding which universities, colleges etc., entrance examinations they showed evidence or promise of passing and being accepted too. Therefore, college placement in the broader sense is handled beyond the immediate school and is amplified by the Juku system.

GENERAL BIBLIOGRAPHY

STUDENT CHARACTERISTICS, LEARNING AND CURRICULUM

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BIBLIOGRAPHY

"About Japan" Series. Education in Japan, Foreign Press Center/Japan, May, 1978.

Anderson, Ronald S. Education in Japan: A Century of Modern Development. Washington, D.C.: U.S. Government Printing Office, 1975.

Armstrong, Ronald E. "A Proposal for US-Japan Cooperative Research on Learning to Learn in the Earth Sciences." Paper presented at the US-Japan Seminar, Washington, D.C., 16-22 November 1985.

Aso, Makoto and Amano, Ikuo. Education and Japan's Modernization. Tokyo: The Japan Times, 1983.

Banduro, A., Ross, D. S., Ross, S. A. "Transmission of Agression Through Initation of Agressive Models," Journal of Abnormal and Social Psychology, 63, 575-582, 1961.

Banduro, A. and Walters, R. H. Social Learning and Personality Development. New York: Holt, Rinehart and Winston, 1963.

Barro, Stephen M. and Lee, Joe W. "A Comparison of Teachers' Salaries In Japan and the United States," October, 1985, (prepared for Center for Education Statistics under Contract 300-84-0265).

Beauchamp, Edward. (1985). "Education" Chapter in Japan's Democracy, Ed. by E. Krauss and T. Ishida., Santa Barbara: Center for the Study of Institutions.

Study of education and democracy in Japan--equality and access

Beauchamp, Edward R., ed. Learning to Be Japanese. Hamden, Conn.: Linnet Books, 1978.

Beauchamp, Edward. (1985). "Reform Traditions in the United States and Japan," chapter in Education Policy in Crisis Ed. W. Cummings, New York Praeger.

Beauchamp, Edward R., Adward, R. and Rubinger, R. Education in Japan: A Source Book. New York: Garland Publishing Co., (in press).

Birnbaum, H. (Sept. 1973). "Japanese Educational Patterns in Science and Engineering," Science, 181; 4106; 1222-1227 (EJ085149).

Bock, R. D. and Spencer, B. (October, 1985). "On Statistical Standards of the Second International Mathematics Study," Conference on Statistical Standards for International Assessment of Student Achievement in Science and Mathematics, National Academy of Sciences.

Borkow, Nancy. Analysis of Test Score Trends: Implications For Secondary School Policy--A Caution to Secondary School Administrators, National Institute of Education, U.S. Department of Education, September, 1982.

Bronfenbrenner, Urie. "Japanese Research and Reality in the Field of Child Development" Research and Clinical Center for Child Development, Faculty of Education Hokkaido University, Sapporo, Japan: Cornell University, Annual Report 1983-1984 pp 1-5.

Brownell, J. A. Japan's Second Language: A Critical Study of the English Language Program in the Japanese Secondary Schools in the 1960's. National Council of Teachers of English, Champaign, Illinois, 1967.

Bruner, J. S. The Process of Education, Cambridge, MA, Harvard University Press, 1960.

Bruner, J. S. The Relevance of Education, New York: Norton, 1971.

Burstein, L. and Hawkins, J. "An Analysis of Cognitive, Affective and Behavioral Characteristics of Students in Japan," Commissioned Research: U.S. Study of Education in Japan, Office of Educational Research and Improvement, D.O.E., Contract #_____ 1986.

Christopher, Robert C. "Who's Winning the Education Race?" December, 1983. Excepted from The Japanese Mind, Reprinted by permission of Linden Press/Simon and Schuster.

Clark, Burton R. "The School and The University: What went wrong in America," Revised Paper delivered at First International Meeting of the American National Academy of Education, Lidings, Sweden, June 4-6, 1984. Unversity of California, Los Angeles.

Comber, L. C. and Keeves, J. P. (1973). Science Education in Nineteen Countries: An Empirical Study. New York: John Wiley and Sons.

Conroy, Mary, Hess, R., Azuma, H. and Kashiwagi, K. "Maternal Strategies for Regulating Children's Behavior." Journal of Cross-Cultural Psychology. Volume 11, No. 2. June 1980, pp. 153-172.

Cool, K. O., and Lengnick-Hall, C. A. (1985). Second thoughts on the transferability of the Japanese Management Style. Organization Studies, 6, 1-22.

Crosswhite, F. J., Dossey, J. A., Swafford, J. O., McKnight, C. C., and Cooney, T. J. (1985). Second International Mathematics Study: Summary Report for the United States. Champaigne (Ill.): Stipes Publishing.

Cummings, W. K. (1980). Education and Equality in Japan. Princeton, N. J.: Princeton University Press.

Dickson, W. P., Hess, R. D., Miyake, N., and Azuma, H. (1979). "Referential Communication Accuracy Between Mother and Child as a Predictor of Cognitive Development in the United States and Japan". Child Development, 50, 53-59.

Doi, Takeo. The Anatomy of Dependence, Tokyo, Kodansha, 1973.

Doyle, Denis P., and Hartle, Terry W. "Excellence in Education: The States Respond," Unpublished manuscript (a paper prepared for AEI's Public Policy Week) December 5, 1984, Washington, D.C.

Easley, Jack. "An American Method of Teaching, Developed in Japan and Transplanted Back into America." Paper presented at the US-Japan Seminar, on Science Education, Washington, D.C., 16-22 November 1985.

Easley, J., and Easley, E. "Horizontal Mathematics." Journal of Curriculum Studies, 15(4) 429-31 (EJ28873), Oct-Dec - 1983.

Fetters, W. B., et al. "Schooling Experiences in Japan and the U.S.: A Cross-National Comparison of High School Students." Paper presented at the 1983 Annual Meeting of the American Educational Research Association in Montreal, 13 April 1983.

Freeman, Donald Jr., et al. "The Consequences of Different Styles of Textbook Use in Preparing Students For Standardized Tests," Institute for Research on Training, Michigan State University, January, 1982.

Fujimoto, Haruyoshi. "Earth Science Education in Secondary Schools." Science Education in Japan. Tokyo: Japanese National Commission for UNESCO, 1968, pp. 42-49.

Fuller, Bruce, et al. "The Family's Influence in Socializing Children: Legitimizing the School or Nurturing Individual Competence?" discussed at the Comparative and International Education Society's northeast regional conference in New York City, 1984, February 1985.

Furihata, Katsunobu. "Science Education in the First and Second Grades." Paper presented at the US-Japan Seminar on Science Education, Washington, D.C., 16-22 November 1985.

Glasman, Waftaly, S, and Biniaminor. "Input-Output Analyses of Schools" Review of Educational Research, Winter, 1981, Volume 51, No. 4, pp 509-539.

Glass, Bentley. "The Japanese Science Education Centers." Science 154 (14 October 1966):221-228.

Hane, Mikiso. Peasants, Rebels and Outcasts: The Underside of Modern Japan. Pantheon Books: New York, 1982.

Harnisch, D. L. and T. Sato. (October 1983). "Differences in Educational Influences and Achievement in Mathematics for Secondary Students in Japan and the United States" paper presented at the ICMI-JSME Regional Conference on Mathematical Education, Tokyo.

Harnisch, D. L. and K. E. Ryan. (February 1985). "An Investigation of the Relationship of Achievement Motivation with Achievement in Mathematics for Students in the United States and Japan in Mid-Western Educational Researchers, 6, 5-21. (ED235886)

Harnisch, D. L., H. J. Walberg, S. L. Tsai, T. Sato, and L. J. Fyans, Jr. (in press) "Mathematics Productivity in Japan and Illinois" in Evaluation in Education: International Progress, pp. 277-284.

Hawkins, John W. "Educational Demands and Institutional Response: Down Education in Japan," Comparative Education Review, March 1983.

Hess, R. D., H. Azuma, S. D. Holloway, and K. Kashiwagi. (in press) "Cultural Variations in the Socialization of School Achievement: Contrasts Between Japan and the United States."

Hess, Robert D., et al. "Material Expectations For Mastery of Developmental Tasks in Japan and the United States" International Journal of Psychology, Volume 15, 1980, pp 259-271, North-Holland Publishing Company.

Hess, Robert D., et al. "Family Influences on School Readiness and Achievement in Japan and the United States: An Overview of a Longitudinal Study." October, 1984, appeared in H. Stevenson, H. Azuma, T. K. Hakuta (Eds.), Child Development and Education in Japan, Freeman Publishers, 1985.

Higher Education Bureau, Minstry Of Education, Science and Culture (MOMBUSHO). Japan: "Higher Education in Japan," October 1984.

Hooper, F. H., and DeFrain, J. D. (1980). On delineating distinctly Piagetian contributions to education. Genetic Psychology Monographs, 101, 151-181.

Hueftle, Stacey J.; Rakow, Steven J.; and Welch, Wayne W. Images of Science. Science Assessment and Research Project, University of Minnesota, 1983.

Hurd, Paul DeHart. An Overview of Science Education in the United States and Selected Foreign Countries. Washington, D.C.: National Commission on Excellence in Education, 1982.

Husen, Torsten. "Are Standards in U.S. Schools Really Lagging Behind Those in Other Countries?" Phi Delta Kappen 64 (March 1983):455-461.

Husen, Torsten (ed). International Study of Achievement in Mathematics: A Comparison of Twelve Countries, Wiley, Volume I and II, 1967.

Ichikawa, S. (1984). "American Perceptions of Japanese Education," paper presented at the EWC Conference on Learning from Each Other.

Ikuo, Amano. "Educational Reform in Historical Perspective." Japan Echo, Volume XI, No. 3, 1984.

Imahori, Kozo. "Out-of-School Science Activities in Japan at the Primary and Secondary School Level." The Journal of Science Education in Japan 6 (1982):57-58.

Inkeles, Alex. "National Differences in Scholastic Performance" Comparative Education Review V:23:1, October 1979.

Ito, N., Nakayama, H., Shibanuma, S., et al. "Basic Science in Upper Secondary School Education in Japan, II. The Structure of Basic Science and Examples of a Teaching Program," Science Education 60(4):441-452, 1976.

Jackobson, W., Takemura, S., Doran, R., et al. "An Analysis and Comparison of Science Education in Japan and the United States." Commissioned Research: U.S. Study of Education in Japan, Office of Educational Research and Improvement, D.O.E., Contract #_____ 1986.

Jacobson, Willard J. National Report: U.S.A. New York: Teachers College, Columbia University, 1985.

Jacobson, Willard J. and Doran, Rodney L. "The Second International Science Study: U.S. Results." Phi Delta Kappan 66 (February 1985):414-417.

Jacobson, Willard J. and Miller, June K. "Science Education in the United States." New York: Second International Science Study, Teachers College, Columbia University, 1984. (Duplicated)

James, Estelle, and Benjamin, Gail. "Public Versus Private Education: The Japanese Experiment." (Program on Non-Profit Organizations, PONPO Working Paper, No. 81), Institutions for Social and Policy Studies, (ISPS Working Paper No 2081), Yale University, May 1984.

Japan. Agency for Cultural Affairs. Outline of Education in Japan, 1970.

Japan. Ministry of Education. Educational Standards in Japan-1980, 1981.

Japan. Ministry of Education. Science Achievement in Japan. Report of the 1957 Nationwide Survey, 1959.

Japan. Ministry of Education. Survey on Schools, 1984.

Japan. Ministry of Education, Research and Statistics Division. Educational Statistics, 1974.

Japan. Ministry of Education, Science and Culture, Research and Statistics Division. Japan's Modern Educational System-A History of the First Hundred Years, 1980.

Kiumonth, Earl H. "Engineering Education in the United States and Japan," (a lecture for the National Institute for Educational Research) Tokyo, Japan, March 8, 1985, Kobi University.

Kirst, M. W. (June 1981). "Japanese Education: Its Implications For Economic Competition in the 1980s" Phi Delta Kappan, 707-708. (EJ245753)

Kitamura, K. (1984). "Education in a State of Decline in Japan?" paper presented at the EWC conference on Learning from Each Other.

Kobayashi, Tetsuya. Society, Schools and Progress in Japan. New York: Pergamon Press, 1976.

Kobayashi, T. (Oct. 1980). "Into the 1980's: The Japan Case." Comparative Education, 16(3), 237-44. (EJ235689)

Kobayashi, V. N. "John Dewey in Japanese Educational Thought." Dessertation submitted to the University of Michigan, Ann Arbor; University Microfilms, Inc. 65-5332, 198 pp, 1964.

Kobayashi, V. N. (Fall 1984). "Tradition, Modernization, Education: The Case of Japan," Journal of Ethnic Studies, 12(3), 95-118. (EJ307897)

Kojima, H. "A Cultural Background of Learning and Problem Solving in Japan." Paper presented at the Conference on Child Development in Japan, Ann Arbor, Michigan, April, 1985.

Kojima, H. "Assessment of Field Dependence in Young Children." Perceptical and Mater Skills 46, 479-492, 1978.

Kojima, H. (in press a). Becoming nurturant in Japan: Past and Present. In A. Fogel and G. F. Melson (Eds.), Origins of Nurturance, Hillsdale, N.J.: Lawrence Erlbaum Associates, pp 123-139.

Kojima, H. (in press b). Child-rearing concepts as a belief-value system of the society and the individual. In H. W. Stevenson, H. Azuma and K. Hakuta (Eds.), Child Development and Education in Japan, San Francisco: Freeman.

Kojima, H. (in press c). Japanese concepts of child development from the mid-17th to mid-19th century. International Journal of Behavioral Development.

Kojima, H. "The Influence of Western Philosophy and Theories of Psychology and Education on Contemporary Educational Theory and Practice in Japan." Commissioned Research: U.S. Study of Education in Japan, Office of Educational Research and Improvement, D.O.E., Contract #_____ 1985.

Kojima, Shigeo. "IEA Science Study in Japan With Special Reference to the Practical Test." Comparative Education Review 18 (June 1974):262-267.

Kumagai, Hisa. "A Dissection of Intimacy: A Study of 'Bipolar Posturing' in Japanese Social Interaction - Amaeru and Amayakasu, Indulgence and Deference." Culture, Medicine and Psychiatry, 1981, 5, pp. 249-272.

Kurachi, Akemi. "Reactions to an Incident Involving a Child in School: A Comparison of Japanese and American Mothers and Teachers' Reactions." Journal of Cross Cultural Psychology, Volume 15, No. 3, September 1984, pp 321-336.

Lanham, Betty. "The Psychological Orientation of the Mother-Child Relationship in Japan." Monumenta Nipponica. Volume XXI, Numbers 3-4, 1966, pp. 322-333.

Lebra, Takie Sugiyama. Japanese Patterns of Behavior. University Press of Hawaii, Honolulu, 1976.

Lebra, Takie S. Japanese Patterns of Behavior. East West Center, University of Hawaii Press, Honolulu, 1979.

Lewis, Catherine. "Cooperation and Control in Japanese Nursery Schools." Comparative Education Review, Volume 28, No. 1, 1984, pp. 69-84.

Lewis, C. "Education in Japan: The Creativity Issue." Commissioned Research: U.S. Study of Education in Japan, Office of Educational Research and Improvement, D.O.E., Contract #_____ 1985.

Lewis, Michael. "The Present State of Child Development Study in Japan." Research and Clinical Center For Child Development, Faculty of Education Hokkaido University, Sapporo, Japan: Rutgers Medical School Annual Report 1983-1984, pp. 7-10.

Mackay, Alan. "An Outsider's View of Science in Japan." Impact of Science on Society 12 (1962):177-201.

Matsuzaki, Iwao. Elerazo, Gurilio O. ed. "Educational Research in Japan" Educational Research and National Development. Proceedings and Working Papers, Third International Conference on Educational Research in Asia and the Southern Pacific. National Science Development Board, Manila, Philippines, June 24-29, 1968.

Mattheis, Floyd E., Spooner, William E., and Coble, Charles R. "A Study of the Logical Thinking Skills, Integrated Process Skills, and Attitudes of Junior High School Students in North Carolina." Greenville, North Carolina: East Carolina University, 1985.

Miller, June K. An Analysis of Science Curricula in the United States. New York: Second International Science Study--U.S., 1985.

Minato, S. (1983). "Some Mathematical Attitudinal Data on Eighth Grade Students in Japan Measured by a Semanetic Differential." Educational Studies in Mathematics, 14, 19-38. (EJ276957)

Ministry of Education, Science and Culture. Course of Study for Elementary Schools In Japan; Educational and Cultural Exchange Division, UNESCO, Government of Japan, 1983. (Monograph)

Ministry of Education, Science and Culture. Course of Study for Lower Secondary Schools in Japan; Educational and Cultural Exchange Division, UNESCO, Government of Japan, 1983. (Monograph)

Ministry of Education, Science and Culture. Course of Study for Upper Secondary Schools in Japan; Educational and Cultural Exchange Division, UNESCO, Government of Japan, 1983. (Monograph)

Ministry of Education, Science and Culture. Statistical Abstract of Education Science and Culture. Research and Statistical Division, Minister's Secretariat: Japan, 1983.

Miyake, Kazuo, and Chin, Shing-jin. "Relation of Temperamental Disposition to Classification of Attachment: A Progress Report" Research and Clinical Center For Child Development, Annual Report 1983-1984, Faculty of Education Hokkaido University, Sapporo, Japan, pp 17-25.

Mori, I., Yano, H., Lee, J., Tadang, N., and Medel, T. E. (1980). Comparison of Elementary School Science Curricula in Four East Asian Countries. Science Education, 64, 405-412.

Morishima, Michio. Why Has Japan Succeeded?: Western Technology and the Japanese Ethos, Cambridge University Press, London, New York, 1982.

Morsbach, Helmut. "Socio-Psychological Aspects of Persistence in Japan." In International Cultural Association of Kyoto (eds); Essays on Japanology 1978-1982. International Cultural Association of Kyoto, Japan, 1983.

Nagano, Shigefumi. "Docility and Lack of Assertiveness: Possible Causes of Academic Success in Japanese Children." Unpublished paper presented at Stanford Conference on Childrearing in Japan, March, 1983.

Nakagawa, Hokichi. "One Hundred Years of Elementary School Science in Japan." Education for Japan-Journal for Overseas 3 (1968):45-59.

National Academy of Education. "Preliminary Reports on Two Cross-Cultural Studies of Early Childhood and Schooling in Japan" Academy Notes, Volume 13, No. 2. Reported at the Academy Meeting, Palo Alto, California, October 8 and 9, 1982.

National Center for Education Statistics. "Science and Mathematics Education in American High Schools: Results from the High School and Beyond Study" NCES Bulletin, May 1984, Office of Educational Research and Improvement, Department of Education.

National Institute of Education. (1985). A United States Study of Education in Japan, 1-6. Available from the Director, United States Study of Education in Japan, United States Department of Education, N.I.E., Washington, D.C. 20208.

National Institute of Educational Research. (1981). Mathematics Achievement of Secondary School Students, Second International Mathematics Study, National Report of Japan: Volume I, (Tables and Figures), (as translated by K. Ishizaka) Tokyo, Japan.

National Institute of Educational Research. (1982). Mathematics Achievement of Secondary School Students, Second International Mathematics Study, National Report of Japan: Volume II, (Tables and Figures), (as translated by K. Ishizaka) Tokyo, Japan.

National Institute of Educational Research. (1983). Mathematics Achievement of Secondary School Students, Second International Mathematics Study, National Report of Japan: Volume III, (Tables and Figures), (as translated by K. Ishizaka) Tokyo, Japan.

National Institute for Educational Research. Use of Computer in Education in Japan. NIER Occasional Paper 03/84. Tokyo: National Institute for Educational Research of Japan, 1984.

National Institute for Educational Research. The Second IEA Science Study: Japanese National Report. Tokyo: The National Institute for Educational Research, No. III, (October 1985).

National Science Board Commission on Precollege Education in Mathematics, Science and Technology. Educating Americans for the 21st Century. Washington, D.C.: National Science Foundation (CPCE-NSF-04).

National Science Foundation Report. "How the U.S. Compares with Other Countries." Educational Leadership 38 (February 1981):368-370.

Nomura, Yujiro. "The Impact of Examination on Science Teaching in Japan," Journal of Science Education in Japan 4 (1980):163-166.

Passin, Herbert. Japanese Education: A Bibliography of Material in the English Language. New York: Teachers College Press, 1970.

Passin, Herbert. Society and Education in Japan. New York: Teachers College Bureau of Publications, 1965.

Peng, Samuel S., Fetters, William B., and Kolstad, Andrew J. High School and Beyond--A Longitudinal Study for the 1980's. A Capsule Description of High School Students. Washington, D.C.: National Center for Education Statistics, 1981. p. 3.

Plisko, Valena White, ed. The Condition of Education, 1983 ed. Washington, D.C.: National Center for Education Statistics (NCES 83-400), 1983.

Random, Sheppard and Tugend, Alina. "Promise of Private Sector Initiative on Gifted Dims Amid Woes." Education Week, Volume IV, No. 11, November 14, 1984, pp 12-15.

Rebischung, J. Japan: The Facts of Modern Business and Social Life. Charles E. Tuttle Co., Rutland, Vermont and Tokyo, 1975.

Robitaille, D. F. and Taylor, A. R. (1985). A Comparative Review of Students' Achievements in the First and Second IEA Mathematics Studies, Report to the National Center for Education Statistics, Urbana, IL: University of Illinois.

Rohlen, T. P. (1983). Japan's High Schools. Berkeley, CA: University of California.

Rohlen, T. P. "Japanese Education: If They Can Do It, Should We?" The American Scholar, 24-43, Winter 1986.

Salkind, Neil, Kojima, H., and Zelniker, T. "Cognitive Tempo in American, Japanese, and Israeli Children." Child Development, Volume 49, 1978. pp. 1024-1027.

Schiller, D. & Walberg, H. J. (March 1982). "Japan: The Learning Society." Educational Leadership, 39(6), 411-12. (EJ259525)

Shigaki, Irene. "Child Care Practices in Japan and the United States: How Do They Reflect Cultural Values in Young Children?" Young Children, Volume 38, No. 4, May, 1983, pp. 13-24.

Shimada, Shigeru. "National Analysis: Japan (International Project for the Evaluation of Educational Achievement-IEA)." International Review of Education 15 (1969):163-182.

Shimahara, Nobuo K. Adaptation and Education in Japan. New York: Praeger Special Studies, 1979.

Shimahara, Nobuo K. "Japanese Education and Its Implications for U.S. Education." Phi Delta Kappan 66 (February 1985):418-421.

Shimahara, Nobuo K. "The College Entrance Examination System and Policy." (American-Asian Conference Paper) Draft Rutgers University.

Simonson, Kenneth D. "Can Japan Succeed?" Washington, DC: Economist (Chairman Millipore Corporation) (Liaison to President's Commission on Industrial Competitiveness).

Singleton, John. Nichu: A Japanese School. New York, Rinehart and Winston, 1967.

Stevenson, Harold. "An Analysis of Japanese and American Textbooks in Mathematics." Commissioned paper prepared for the United States Study of Education in Japan, National Institute of Education, Washington, D.C., October, 1985.

Stevenson, Harold. "An Analysis of Mathematic Textbooks in Japan." Commissioned Research: U.S. Study of Education in Japan, Office of Educational Research and Improvement, D.O.E., Contract #_____ 1985.

Stevenson, Harold. "Classroom Behavior and Achievement of Japanese, Chinese, and American Children." In Robert Glazer (ed); Advances in Instructional Psychology. Hillsdale, N.J., Erlbaum, 1985 (in press).

Stevenson, Harold. "Making the Grade: School Achievement in Japan, Taiwan, and the United States, Annual Report of The Center for Advanced Study in the Behavioral Sciences, 1, 83, Stanford.

Stevenson, Harold, Stigler, James, and Lee, Shin-ying. Achievement in Mathematics. Unpublished, 1984?

Stevenson, H. W., Lee, S., and Stigler, J. W. (1985). Mathematics Achievement of Chinese, Japanese and American Children. Article in press in Science, 19 pp.

Stevenson, H. W., Stigler, J. W., Lee, S., Kitamura, S. and Hsu, C. (1985). Cognitive Performance and Academic Achievement of Japanese, Chinese and American Children. Child Development, 56, 718-734.

Stevenson, H. W., Stigler, J. W., Lucker, G. W., Lee, S., Hsu, C., and Kitamura, S. (1985). Classroom Behavior and Achievement of Japanese, Chinese and American Children. Unpublished manuscript, 42 pp.

Stigler, J. W., Lee, S. Y., Lucker, G. W., and Stevenson, H. W. "Curriculum and Achievement in Mathematics: A Study of Elementary School Children in Japan, Taiwan, and the United States." Journal of Educational Psychology, Volume 74, 1982, pp. 315-322.

Sukemune, S., Haruki, Y., and Kashiwagi, K. (1977). Studies of Social Learning in Japan. American Psychologist, 32, 924-933.

Taira, K. (1978). History of Science Education in Japan Since 1945. Science Education, 62, 585-589.

Takemura, Shigekazu. Study of Position of Science Education in Japan. (unpublished manuscript) Faculty of Education, Graduate Study, Hiroshima University Japan, 1984.

Takeo, Doi, M.D. translated by: John Bester. The Anatomy of Dependence. Kodansha International Ltd. 1971, Copyright 1973, Tokyo, New York, San Francisco, pp. 418-421.

Taniuchi, Lois. "Interrelationships Between Home and Early Formal Learning Situations for Japanese Children." Paper presented at the Annual Conference of the Comparative and International Education Society. City University of New York, New York, November 26, 1984.

Taniuchi, Lois. "Management of Classroom Discipline in Japan and the Role of the Elementary School Teacher." Commissioned Research: U.S. Study of Education in Japan, Office of Educational Research and Improvement, D.O.E., Contract #_____ 1985.

Taniuchi, Lois. "The Psychological Transition from Home to School and the Development of Japanese Children's Attitudes Toward Learning." Unpublished Qualifying Paper, Laboratory of Human Development, Harvard Graduate School of Education, Cambridge, Mass., August, 1982.

Teichler, Ulrich and Voss, Friedrich. Bibliography on Japanese Education: Postwar Publications in Western Languages. Munich: Verlag Dokumentation, 1974.

Terada, Fumiyuki. "Present Status and Future Scope of the Use of Microcomputers in Mathematics Education." Paper presented at the US-Japan Seminar on Science Education, Washington, D.C., 16-22, November 1985.

The School Textbook System in Japan. NIER Occasional Paper 04/84. Tokyo: National Institute for Educational Research of Japan, 1984.

The Tokyo Office of the U.S. National Science Foundation "Educational Reform In Japan: Some Controversial Recommendations" Report Memorandum #67 February 27, 1985.

Thier, H. D. (1976). In-service Training of Elementary School Science Teachers: A United States-Japan Seminar. Science Education, 60, 551-558.

Torrance, E. Paul. (Winter 1982). "Education for 'Quality Circles' in Japanese Schools," Journal of Research and Development in Education, 15(2), 11-15. (EJ258794)

Torrance, E. Paul. "Lessons About Giftedness and Creativity From a Nation of 115 Million Overachievers." Gifted Child Quarterly 24 (Winter 1980):10-14.

Torrance, E. Paul and Sato, Saburo. "Differences in Japanese and United States Styles of Thinking." Creative Child and Adult Quarterly 4 (1979):145-151.

Travers, K. (October 1985). "The Second IEA Mathematics Study in the United States: Some Personal Reflections", Conference on Statistical Standards for International Assessment of Student Achievement in Science and Mathematics, National Academy of Sciences.

Troost, Kay Michael. "Science Education in Contemporary Japan." In Science Education in Global Perspective, pp. 13-66. Edited by Margarete Siebert Klein and F. James Rutherford. Boulder, Colo.: Westview Press, Inc., 1985.

U.S. Congress. House Subcommittee on Science, Research and Technology. U.S. Science and Engineering Education and Manpower: Background; Supply and Demand; and Comparison with Japan, the Soviet Union, and West Germany, 98th Cong., 1st sess., 1983, by the Congressional Research Service Library of Congress.

Veno, Tatsumi. "Kindergarten Education in Japan - Its Development and Characteristics." Research Report No. 4, September, 84, Hyogo University of Education.

Vogel, E. F. (1979). Japan as Number 1: Lessons for America. Cambridge, Mass.: Harvard Press.

Vogel, Ezra. Japan's New Middle Class, University of California, Berkeley, 1963.

Walberg, H. J. (1983). "Scientific Literacy and Economic Productivity in International Perspective," Daedalus, 112, 1-29.

Walberg, H. J. (October 1983). "We Can Raise Standards," Educational Leadership, 41(2), 4-6. (EJ286659)

Weisz, J. R., Rothbaum, F. M., and Blackburn, T. C. (September 1984). "Standing Out and Standing In, The Psychology of Control in America and Japan" American Psychologist, 39(9), 955-969.

White, M. I. (Summer 1984). "Japanese Education: How Do They Do It?" Public Interest, 76, 87-101. (EJ302239)

Zenger, John F. "The Puzzle of Higher Education," Change, Jan/Feb 1984? Volume 16, No. 1, pp. 24-31.